

Cause & Effect

Fourth Edition

Patricia Ackert | Linda Lee

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To the Instructor

Reading and Vocabulary Development 3: Cause and Effect is a best-selling beginning reading skills text designed for students of English as a second or foreign language who have a basic vocabulary in English of about 1,300 words. This text teaches about 700 more words.

Cause and effect is one in a series of reading skills texts. The complete series has been designed to meet the needs of students from the beginning to the high intermediate levels and includes the following:

Reading and Vocabulary Development 1. FACTS & FIGURES

Reading and Vocabulary Development 2. THOUGHTS AND FIGURES

Reading and Vocabulary Development 3. CAUSE & EFFECT

Reading and Vocabulary Development 4. CONCEPTS & COMMENTS

In addition to the student text, an answer key, VHS, DVD, audio cassette, and audio CD are also available. *Cause and Effect* uses the following methodology:

- **Theme – based approach to reading.** Each of the five units has a theme such as world issues, science, or health.
- **Systematic presentation and recycling of vocabulary.** One of the primary tasks of student is developing a useful and personally relevant vocabulary base. In Cause and Effect, up to 24 words are introduced in each lesson. These words appear in boldface type. Those underlined are illustrated or glossed in margin. All of the new vocabulary items are used several times in the lesson, and then are systematically recycled throughout the text.
- **Pedagogical design.** The central goal of Cause and effect is to help students develop the critical reading skills they will need for academic, personal, and or career purposes. By any standard, the range of exercise types in Cause and Effect is rich and varied. This text provides students with practice in

comprehension, building vocabulary, making inferences, finding the main idea, determining cause and effect, scanning, summarizing, paraphrasing, understanding the sequence of events, and learning to work more effectively with two-word verbs, compound words, connecting words, and noun substitutes.

Organization of Cause and Effect

Cause and Effect is organized into five units. Each unit contains five lessons packed with exercises and activities.

- **“Before You Read” Questions.** These pre-reading questions provide a motivation for reading the text.
- **Context Clues.** A context clue exercise at the beginning of each lesson introduces some of the vocabulary for the following lesson. This section is designed to pre-teach particularly important vocabulary items.
- **Vocabulary.** The first two exercises give practice with new words in a different context but with the same meaning.
- **Vocabulary Review.** Vocabulary items are used in subsequent texts and exercises to give additional review. They are fill-ins or matching synonyms and antonyms.
- **Comprehension.** First is a set of true/false, true/false/ not enough information, or multiple choice questions. Then come comprehension questions may also be given as written assignments.
- **Main Idea.** Students must choose the main idea of the paragraph from three possibilities.
- **Word Study.** A selection of word study exercises is provided at the end of each lesson. It reinforces structural points, such as verb forms, two-word verbs, and articles that the students are learning in other classes. It also gives spelling rules for noun plurals and verb endings. Later units have charts of word forms. The exercises are not intended to be complete explanations and practice of the grammar points.
- **Writing.** Each lesson closes with a writing exercise.

- **Extension Activities.** Each unit ends with a set of high-interest, interactive tasks to help students practice the new vocabulary and the skills they have learned in more open-ended contexts.

CNN Video Highlights - The highlight of each set of extension activities is a short video-based lesson centered on a stimulating, authentic clip from the CNN video archives. Each video lesson follows the same sequence of activities.

Before You Watch encourages students to recall background knowledge based on their own experiences or from information presented in the readings.

As You Watch asks students to watch for general information such as the topic of the clip.

After You Watch gets the students to expand on the main points of video by establishing further connections to the reading passages, their own experiences, and their ideas and opinions.

Activity Page – Games found on this page encourage students to practice the vocabulary and structures found in that unit’s lesson in a relaxed, open-ended way.

Dictionary Page – Exercises on this page offer students practice with dictionary skills based on entries from The Newbury House Dictionary of American English.

- **Skills Index.** This index provides teachers and students with a handy reference for all of the reading and writing skills introduced in Cause and Effect, as well as all of the grammatical structures found in the text.

New to This Edition

The best-selling reading series just go better! The fourth edition of *Cause and Effect* contains new readings, new pedagogy, and new ancillaries.

- Four fresh new readings engage students in fascinating new topics. The new readings for this edition are as follows:
Unit 1, Lesson 5: Into the Deep: Ocean Exploration
Unit 2, Lesson 5: The Garbage Project
Unit 3, Lesson 3: Languages and Language Diversity
Unit 5, Lesson 4: Medicine: From Leeches to Lasers
- Thoroughly updated and checked for factual accuracy, each reading has been revised to include level-appropriate structures and vocabulary.
- New pedagogical design, photos, and illustrations aid student comprehension and ease navigation through the text.
- Exam View Pro test-generating software allows instructors to create custom test and quizzes.
- A new website (found at <http://elt.thomson.com/readingandvocabulary>) features vocabulary flashcards, crossword puzzles, quizzes, and more to help students review for tests.

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Explorers

unit 1



One doesn't discover new lands without consenting to lose sight of the shore for a very long time. ---Andre Gide

LESSON

1

Burke and Wills:

Across Australia



Before You Read

1. What information about Australia do the map and the photograph give you?
2. Is Australia larger or smaller than your country?
3. What else do you know about Australia?

1

Burke and Wills:

Across Australia

Australia is a huge country, and the outback (Australian word for the **interior** of the country) is desert. In some years, it rains only eight centimeters in the outback, but in other years, rainstorms **turn** the desert **into** sandy swamps.

inside; away from the coast

turn into = change (something); become

Until the eighteenth century, only **aborigines** lived in Australia. These are the first people who lived in Australia. When Europeans went there to live, they **built** towns on the coast. However, in the 1850s, people began thinking more about the interior.

In 1860, Robert O'Hara Burke, a police officer from Ireland, was **chosen** to lead an **expedition** across the continent from south to north. He took with him William John Wills and eleven other men, camels, horses and enough **supplies** for a year and half. They left Melbourne for the Gulf of Carpentaria on August 20, winter in the southern **hemisphere**.

past participle of choose

food and other necessary things

half of the Earth or any other sphere

The expedition had problems from the beginning. Burke had no experience in the outback. The men fought and would not follow **orders**. Twice they left some of their supplies so that they could move faster and later sent one of the men, William Wright, back for them.

commands; directions

Finally, a small group led by Burke moved on ahead of the others to a river named Cooper's Creek and set up their **base** camp. They were **halfway** across the continent, but it was summer now, with very hot weather and sandstorms.

at last

They waited a month for Wright, and then Burke decided that four from his small group, with three months supplies, should travel the 1,250 kilometers to the north coast as quickly as possible. They told the others to wait for them at Cooper's Creek.

The journey across the desert was very difficult, but at the end of January, they reached the Flinders River near the Gulf of Carpentaria. They started their return journey, but now it was the rainy season and travelling was slow and even more difficult than on their trip north. They did not have enough food, and the men became hungry and sick. Then one of them died. Some 40 of the camels died or were killed for food.

Finally, on April 21, they arrived back at Cooper's Creek, only to find that no one was there. The rest of the expedition had left the day before because they thought Burke must be dead.

45 The men continued south, but without enough food, both Burke and Wills died. Aborigines helped the last man who was still alive, and a **search party** found him in September 1861. He was half crazy from hunger and **loneliness**.

a group of people who look for someone who is lost

There were many reasons that the expedition did not go as planned. It had an inexperienced leader, the men made bad decisions, some did not follow orders, and they did not **get along**. But it was the first expedition to cross Australia, and Burke and Wills are still known as 55 **heroes of exploration**.

be friendly; not fight

a Vocabulary

In this book, difficult words are repeated several times in the exercises. These words are also repeated and reviewed in other lessons. It is not necessary to list new English words with their meanings in your own language. You will learn them just by practicing. In each lesson, when you read the text the first time, underline the words you don't know. Then you can give yourself a test when you finish the lesson. Look at the words you underlined and see if you understand them. If you don't know them yet, this is the time to memorize them.

In the vocabulary exercises in this book, write the correct word in each blank. Use word only once. Use capital letters where they are necessary.

exploration	built	hemisphere	halfway
finally	orders	expedition	loneliness
aborigines	gets along	base	heroes

1. The captain of a ship gives _____, and the sailors must follow them.
2. In baseball, a player hits the ball and runs to first _____.
3. The first Australians are called _____.
4. Most of the Earth has been explored. Now we are in the age of space _____, searching for more information about the stars, the moon, and other planets besides Earth.
5. Kumiko _____ well with everyone. She is always nice and never fights with people.
6. We _____ our new home from the wood and stone on our land.
7. _____ is a common feeling when you are far from your friends and family.
8. Asia is in the northern _____.
9. The writer Jane Austen said "_____ doings never prosper. "I think she meant that it's important to complete things.
10. People who win in the Olympic Games are _____ in their countries.

b Vocabulary

Do this exercise the same way you did Exercise a.

chosen	expedition	party	explored
build	interior	got along	finally
searching	supplies	swamps	turned into

1. Burke and Wills led an _____ into the interior of Australia.
2. The explorer Christopher Columbus was _____ for a new way to go India.
3. Burke and Wills _____ the interior of Australia.
4. Birds like to live in _____ because there is a lot of water and food.
5. We use one kind of paint for the _____ of a house and another kind for the exterior.
6. After three days of driving, I _____ arrived at the coast.
7. A search _____ was sent to find the Burke and Wills expedition.
8. The president of the United States is _____ by the people who vote.
9. The secretary ordered paper, pens, and other _____ for the office.
10. Carlos started to study hard, and he eventually _____ a good student.

C True/False

Write T if the sentence is true. Write F if it is false. If a sentence is false, change it to make it true or explain why it is false. An asterisk () before an item means that the answer is either an **inference** or an **opinion**. You cannot find the answer in a sentence in the text. You have to think about the information in the text and things you already know and then decide on the answer.*

- _____ 1. The first Europeans in Australia built in villages in the outback because there were too many aborigines on the coast.
- _____ 2. The Burke and Wills expedition crossed Australia from south to north.
- _____ 3. December is a summer month in Australia.
- _____ 4. Much of the interior of Australia is swampy all year long.
- _____ 5. Eleven men crossed Australia with Burke and Wills.
- _____ 6. Burke and Wills did not have enough food for their journey back to Cooper's Creek because the rain slowed them down.

_____ 7. The aborigines could help the last man still alive because they understood how to live in the desert.

_____ 8. Burke was a good leader for this expedition.

d

Comprehension Questions

Answer these questions in complete sentence. An asterisk (*) means that the answer is either an inference or an opinion. You cannot find the exact answer in the text.

1. Where did the first Europeans live when they went to Australia?
2. Why were camels good animals for this expedition?
3. Why did the men leave some of their supplies behind?
4. Why was it difficult to travel in the interior of Australia?
5. What happen to some the camels?
6. Give two reasons why this expedition had so many problems.
7. Do you think Burke and Wills should be called heroes of exploration? Why?

e

Main Idea

What is the main idea of paragraph 4(lines 18-22)?

- a. Robert Burke led this expedition.
- b. The expedition had many problems.
- c. Burke had no experience in the outback.

f

Two-Word Verbs

English has many two-word verbs. Each of the two words is easy, but when they are put together, they mean something different. There is often no way to guess what they mean. You have to learn each one.

Learn these two-word verbs and then fill in the blanks with the right words. Use the correct verb form.

turn into	=	change(something) into; become
get along (with)	=	not fight; be friendly
break down	=	stop going or working (often said about a car)
call on	=	ask(someone) to speak(as when a teacher asks

put away = a student to speak
put(something) in the place where it belongs

1. Our washing machine _____ yesterday, and I couldn't finish washing my clothes.
2. Tommy and his little brother don't _____ very well .They fight about something almost every day.
3. Ali knew the answer when the teacher _____ him.
4. It was rainy this morning, but now it has _____ a beautiful day.
5. Mary doesn't usually _____ her clothes. She just leaves them on a chair or the bed.



Articles: A, AN, The

There are so many rules about articles that it is easier just to get used to them by practicing just to learn all the rules. However, you will learn a few of the rules later in this book.

Here are some sentences or parts of sentences from the text. Put an article in the blank if it is necessary.

1. In other years, rainstorms turn _____ desert into sandy swamps.
2. Until _____ eighteenth century, only aborigines lived in Australia.
3. In 1860, _____ Robert O'Hara Burke, _____ police officer from Ireland, was chosen to lead _____ expedition across _____ continent from south to north.
4. He took with him William John Willis and eleven other men, _____ camels _____ horses, and enough supplies for _____ year and _____ half .
5. _____ expedition had problems from _____ beginning.
6. _____ men fought and would not follow _____ orders.



Guided Writing

Write one of these two short compositions.

1. You are the last person still alive from the Burke and Wills expedition. It is September 1861, and the search party has just found you. Tell them what happened to you.
2. You are the leader of another expedition across Australia. Explain what you will do differently.

LESSON

2

Alexandra David-Neel: A French Woman in Tibet



Before You Read

1. What do you know about the history and geography of Tibet?
2. What information does the photograph give you about Alexandra David- Neel?
3. Alexandra David-Neel traveled alone to Tibet in the early twentieth century. What do you think her goal was?

Context Clues

It is not necessary to look up every new word in the dictionary. You can often tell what a word means from sentence it is in or from the sentence after it. For example, the word **aborigines** in line 6 on page 3 are explained in the next sentence. Take a look. What are aborigines? Always look for context clues when you are reading. Try not look up every new word in your dictionary.

*The words in **bold** print below are from this lesson. Use context clues to guess what each word means. Do all the Context Clues exercises in the book this way.*

1. David-Neel was very unhappy when she was a child. She **escaped** her unhappiness by reading books on adventure and travel.
2. Later, she studied the Buddhist religion and wrote **articles** and books about it.
3. In 1903, she started working as a **journalist**, writing articles about Asia and Buddhism for English and French magazines and newspapers.
4. She wrote her husband long letters full of details about her travels.
5. For centuries, Tibet was a **secret** and mysterious place to the rest of the world. Only a few foreigners were able to visit the area.

2 Alexandra David-Neel: A French Woman in Tibet

Tibet has been **secret** and mysterious place to the rest of the world for several centuries. It is on a high plateau in Asia, **surrounded** by even higher mountains, and only a few foreigners were able to cross its **borders** until recently.

legal lines between
countries

One of these foreigners was a French woman named Alexandra David-Neel (1868-1969). She traveled by herself in India, China, and Tibet. She studied the Buddhist religion, wrote **articles** and books about it, and collected ancient Buddhist books. She also became a Buddhist herself.

David-Neel always said she had unhappy **childhood**. She **escaped** her unhappiness by reading books and on adventure travel. She **ran away** from school several times and even ran away to England at 15 when she was only 16.

left without telling
anyone

She was a singer for several years, but in 1903 she started working as a **journalist**, writing articles about Asia and Buddhism for English and French magazines and newspapers. The next year, when she was 37 she married 20 Philippe-Francois Neel. It was an unusual marriage. After five days together, they moved to different cities and never lived together again. Yet he **supported** her all his life, and she wrote him hundreds of long letters full of **details** about her travel.

gave her money to live
on

She traveled all over Europe and North Africa, but she went to India in 1911 to study Buddhism, and then her **real** travels began. She traveled in India and also in Nepal and Sikkim, the small countries north of India in the Himalaya Mountains, but her goal was Tibet. She continued to study Buddhism and learned to speak Tibetan. She traveled to villages and religious centers, with only an interpreter and few men to carry her camping equipment. For several months, she lived in a **cave** in Sikkim and studied Buddhism and the Tibetan language. Then



cave

she adopted a 15-year-old Sikkimese boy to travel with her. He **remained** with her until his death at the age of 55.

For the next seven years, she traveled in **remote** areas of China. These were years of **civil war** in China, and she was often in danger. She travel for thousands of kilometers on horseback with only a few men to help her –through desert heat and sandstorms and the rain, snow, and freezing **temperatures** of the colder areas.

In 1924, David-Neel was 56 years old. She darkened her skin and dressed as an old **beggar**. She carried only a beggar's bowl and backpack and travelled through hot low lands and snowy mountain passes until she reached the border and reached the border of Tibet. Because she spoke Tibetan so well she was able to crossed the border and reached the famous city of Lhasa without anyone knowing that she was a European and forbidden to be there. It was often freezing cold, and sometimes there wasn't enough food. Sometimes she was sick, and once she nearly died. This was the most dangerous of all journeys, but she reached her goal and collected more information about Tibetan Buddhism. She returned to France in 1925. She spent several years writing about her **research** and adventures and 60 translating ancient Tibetan religious books. When she was 66, she returned to China and the Tibetan border area for ten years. In 1944, the second World War reached even that remote area, and at the age of 76, she walked for days, sometimes without food, until she was 65 able to reached a place from which she could to India and then home to France. She continued writing and translating until she died, just seven weeks before her 101st birthday.

Most explorers traveled to discover and map new places. David-Neel went to do research on Buddhism. She said that freedom was the most important thing in life for her, and, **like** many other explorers, she lived a dangerous, exciting, free life.

stayed

far from towns

war between people
in the same country



beggar

search for new
information.

similar to

a Vocabulary

Write the correct word in each blank. Use a word only once, and use capital letters if they are necessary.

civil war	temperature	like	border
childhood	article	secret	beggars
caves	journalist	remote	remained

1. We didn't tell him about his birthday party. We wanted it to be a _____.
2. There is an interesting _____ in the newspaper today about Tibet.
3. You can find _____ asking for money in most countries.
4. She lived in Asia when she was an adult, but she spent her _____ in England.
5. Some ancient North Americans lived in _____. Others built houses.
6. Normal body _____ is 98.6 degrees Fahrenheit.
7. She went to India in 1911 and _____ there for several years.
8. In the United States, the northern states and the southern states fought a _____ that lasted from 1861-1865.
9. The Himalayas are on the _____ between China and India.
10. A _____ collects information and then writes articles about it for magazines and newspapers.

b Vocabulary

Remember to underline the words you don't know as you read the text, and then test yourself when you finish the lesson.

remote	escaped	like	real
details	surrounded	support	journalist
adopted	research	borders	ran away from

1. Everyone calls her Ellie, but her _____ name is Elizabeth.
2. Our house is cool in hot weather because it is _____ by big trees.

3. Nepal, _____ Tibet, is in the Himalaya Mountains.
4. Mr. and Mrs. Thompson _____ a baby because they couldn't have children of their own.
5. He _____ school when he was 15 years old and joined the navy.
6. Most English paragraphs have a main idea and supporting _____.
7. Parents usually _____ their children until the children finish school.
The parents pay for everything the children need.
8. Dr. Garcia is doing _____ for space exploration.
9. Her friends live in a _____ part of Alaska. The only way to get there is by plane.
10. A snake _____ from the zoo last night. If you see it, call the police immediately.

C Multiple Choice

Circle the letter of the best answer. An asterisk () means that the answer is an inference or opinion. You cannot find the answer in a sentence in the text.*

1. Alexandra David-Neel went to Asia to _____.
 - a. Study Buddhism
 - b. Lead an expedition
 - c. Adopt a son
2. When she was a child, she read to _____.
 - a. Become a Buddhist
 - b. Escape her unhappiness
 - c. Learn about Europe
3. After she got married, _____.
 - a. She lived in Europe with her husband for several years
 - b. Her husband supported her
 - c. Her husband travel in Europe with her.
4. It is impossible that she _____.
 - a. Took photographs during her travels
 - b. Had a car when she lived in a cave
 - c. Spoke Tibetan to her Indian Friends.

5. The place she wanted most to visit was _____.
 - a. India
 - b. China
 - c. Tibet
6. Her travels in China were dangerous because _____.
 - a. There was a civil war
 - b. She was traveling on horseback
 - c. She was a beggar
7. David-Neel said that _____.
 - a. She wasn't afraid of danger
 - b. Freedom was very important to her
 - c. She wanted her husband to travel with her.

d Comprehension Questions

Always answer the comprehension questions with complete sentences.

1. Why is Tibet a mysterious Place?
2. Why did David-Neel run away from school?
3. What is a journalist?
4. What was unusual about her marriage?
5. What did she do when she was living in cave?
6. What does a remote area mean?
7. Why didn't the Tibetans know she was a foreigner?
8. What kind of work did she do after her last trip?
9. Do you think she lived a free life? Why?

e Main Idea

What is the main idea of paragraph 3(lines 11-15)?

- a. David-Neel read books on travel and adventure.
- b. David-Neel ran away from school several times.
- c. David-Neel had an unhappy childhood.



Word Forms

Choose a word form from line 1 of the chart to use in sentence 1, and so on. Use the right verb forms and singular or plural nouns. There are empty spaces on the chart because there are not four forms for every word.

	VERB	NOUN	ADJECTIVE	ADVERB
1.	adopt	adoption	adopted	
2.	surround	surroundings	surrounding	
3.	beg	beggar		
4.		hero	heroic	heroically
5.	remain	remainder/remains	remaining	
6.	supply	supply	supplied	
7.	explore	exploration		
8.	secret	secret	secretive	secretly
9.		reality	real	really
10.	choose	choice	choice	

- Many _____ children want to meet their birth parents.
- Dad drove so fast on his vacation trip that he hardly saw his _____.
- Small children often _____ to go with their parents when the parents go out at night.
- Jumping into the freezing water to save the child was a _____ action.
- They ate half the chicken and put the _____ in the refrigerator for the next day.
- The company was unable to _____ most of the things we ordered.
- Are you more interested in the _____ of outer space or the Earth's oceans?
- I don't know why my children are being so _____ today. Usually they like to tell me where they are going.
- Can you help me? I'm _____ having trouble with this computer.
- I can't decide which movie to see. You make the _____.



A and **An** are used to show that the noun after it is one of a group.

John Burke was **an** explorer. (He was one of many explorers throughout history.)

Maria is **a** student. (She is one of many students in the world.)

I took **an** apple out of the refrigerator. (It is one of many apples in the world.)

The is used to show that the noun is one special, particular, specific case of the noun or nouns.

John Burke and William John Willis were **the** first explorers to cross Australia.

Maria is **the** best student in the class.

I took **the** apple out of the refrigerator. (There was only one apple in the refrigerator.)

Put the right article in the blanks.

1. Australia is _____ huge country.
2. _____ journalist who wrote this article is a friend of mine.
3. David-Neel was _____ journalist.
4. Please close _____ door.
5. Her office is _____ first one on the left.
6. _____ professor called you today, but I don't who it was.
7. Who was _____ worst teacher you ever had?

h Compound Words

Compound words are common in English. They are two words put together, and the meaning of the compound word is related to the meanings of the two words. They are not like two-word verbs, whose meaning is different from the meaning of each word by itself.

Put these compound words in the right blanks in the sentence below.

horseback

sandstorm

snowstorm

keyhole

mailbox

sidewalk

doorbell

weekend

1. Barbara couldn't drive to her parents' house last week because there was a bad _____, and it was very cold.
2. Abdullah looks in his _____ every day, and he usually finds a letter.
3. A _____ is a place for people to walk at the side of the street.
4. When you unlock a door, you put your key in the _____.
5. The _____ rang, and Susan went to open the door.
6. Did you ever go _____ riding?

i Guided Writing

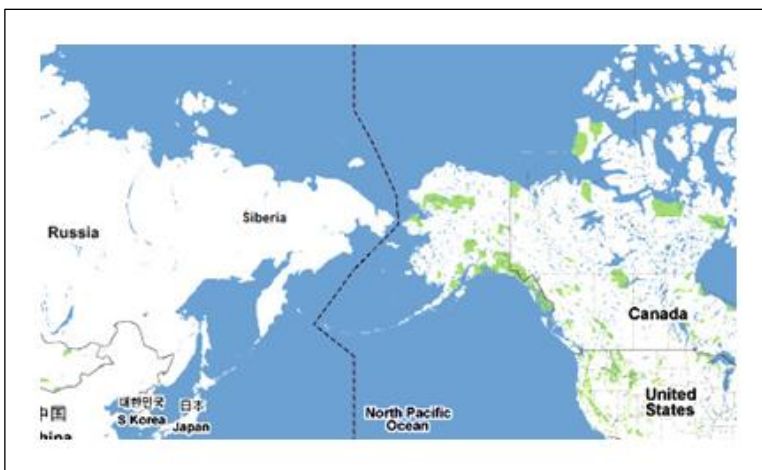
Write one of these two short compositions.

1. You are Alexandra David-Neel. Write a letter to your husband. Describe of one or two of your adventures in some detail. Add your own ideas about what you saw, heard, tasted, touched, or smelled.
2. Describe an adventure you had or an unusual trip you took. Use details about what you saw, heard, tasted, touched, or smelled.

LESSON

3

Vitus Bering: Across Siberia to North America



Before You Read

1. How can you get from Siberia to Alaska?
2. What is the name of the body of water between Siberia and Alaska?
3. Which are longer in Siberia and Alaska, winters or summers?

Context Clues

You can often guess the meaning of a word from the sentence, even if the sentence doesn't explain the word exactly. For example, in this lesson, one of sentence says, "They lost a lot of food when one of the **ships** sank in the storm. " What could a storm do to a ship so that the food was lost? The ship probably went down into the water to the bottom of the ocean. When you can guess easily what a word means from the sentence, don't look up the word in your dictionary.

Now practice with these new words from this lesson. Use context clues to guess what each **bold** word means.

1. Vitus Bering wanted to explore the east coast of Siberia and to find out if Asia and North America were **joined**.
2. Bering made careful plans for his trip, but there were many **delays**. Because of this, he had only one summer to explore the area instead of two years.
3. Bering's expedition **gathered** important scientific information about the interior of Siberia.
4. When scientist read Bering's reports, they **realized** that he was a great explorer.
5. The water between Siberia and Alaska is now called the Bering Sea to **remind** us of this great explorer.

3

Vitus Bering:

Across Siberia to North America

In 1733, the most complete scientific expedition in history up to that time left St. Petersburg, Russia. The goal of the expedition was to explore the east coast of Siberia and to find out if Asia and North America were **joined**. The scientists planned to report on everything: the **geography**, climate, plants, animals, and customs and languages of the Siberian people.

connected

the way parts of a place are positioned within it

The expedition had to across Siberia **in order to** reach the Pacific Ocean. Vitus Bering, the leader the whole expedition, left St. Petersburg with almost 600 people. The group **included** a few scientists, **skilled** workers of all kinds, **soldiers**, and sailors. Alexi Chirikov left later, with most of the scientists and **tons** of supplies.

to

had in it

people in the military

unit of measurement; in the U.S., 2,000 pounds = 1 ton

It took seven years for Bering's and Chirikov's groups to cross Siberia. They travelled mostly in flat-bottomed boats on the rivers. Bering's group spent a year in Tobolsk, where they built a ship and explored the Ob River. They continued to Yakutsk, where they spent four years. Yakutsk was only a small village and there were many people in the expedition, so they had to build their own buildings. They also built boats and explored the Lena River. Then they moved on to Okhotsk on the eastern coast. It took two more years to build ships so that they could explore and map the east coast.

Bering made careful plans, but there were always problems. For example, they lost a lot of their food when one of the ships sank in a storm. But finally, their two ships started for North America. They had only one summer instead of two years for their explorations because of many problems and **delays**. And summers are short in the north.

There was more bad luck. There were storms, and the two ships lost contact, but at the last sailors on Bering's ship

saw mountains a short distance across the sea. This **proved** that North America and Asia were two separate continents.

different

Their problems continued. Their water supply was low, but when the men went **ashore** in Alaska, they got water that was little salty. Many of the men were sick from scurvy, a disease caused by the lack of **vitamin** C. When they drank the salty water, they become even sicker. Then they started dying, one after another.

not having enough

As the ship sailed south, back toward Okhotsk, it became lost in storms. Finally, a storm drove it onto Small Island, and the men knew their ship could not sail again. They were in a place with no trees, but there were birds and animals for food, and **fresh** water to drink. However, it was too late for many of them. Men continued to die from scurvy, and on December 8, 1741, Bering died and was buried on the island that is now name for him. When spring came, the few remaining men were able to build a small ship from the wood in the old one and leave the island.

By this time, the Russian government had lost interest in the North Pacific. Bering's reports were sent back to St. Petersburg and forgotten. Decades later, people **realized** that Bering was a great explorer. His expedition **gathered** important scientific information about the interior of Siberia, made maps of the eastern coast, and discovered a new part of North America. Today, we have the Bering Sea between Siberia and Alaska to remind us of the leader of this great scientific expedition.

periods of ten years

make (us) remember

a Vocabulary

joined realize included separate gather delay
prove geography remind soldiers lack tons

1. The dancer got in a circle and _____ hands.
2. Did you study the _____ of your country in school?
3. Mr. and Mrs. Baker drive to work in _____ cars because they work in different places.
4. Please _____ me to buy some bread, or I might forget.
5. In some restaurants, the waiter's or waitress's tip is _____ in the bill. In others, you leave it separately.
6. Two _____ equals 4,000 U.S. pounds.
7. There will be a short _____ because the chemistry professor needs to get the equipment ready.
8. He didn't _____ what time it was, and he got to class late.
9. _____ have to wear uniforms and follow orders.
10. Burke's expedition failed partly because of his _____ of experience in the Australian outback.

b Vocabulary

proved delay decade in order to includes gathered
ashore fresh skilled separate vitamin reminder

1. Ali is studying English _____ go to an American university.
2. Early explorers _____ that the Earth was round and not flat.
3. Ann _____ up her books and papers and left the library.
4. Scurvy is caused by a lack of _____ C. It was a problem on long ocean trips because sailors didn't have fruit and vegetables to eat.
5. Haiti and Dominican Republic are parts of the same island, but they are _____ countries.
6. A century is 100 years. A _____ is 10 years.

7. Electricians and mechanics are _____ workers.
8. After a half hour in the water, the children walked _____ and dried off.
9. People cannot drink sea water. They need _____ water.
10. This book _____ a table of contents and a map.

C Vocabulary Review: Definitions

Match the words with their meaning. Write the letter of the definition from the second column in the correct blank.

- | | |
|---------------------|-------------------------------|
| ____ 1. hemisphere | a. not fight |
| ____ 2. border | b. study |
| ____ 3. remain | c. at last |
| ____ 4. get along | d. inside |
| ____ 5. research | e. half of the earth |
| ____ 6. Interior | f. isolated |
| ____ 7. finally | g. line between two countries |
| ____ 8. remote | h. writer for magazines |
| ____ 9. turn into | i. become |
| ____ 10. journalist | j. stay |

d True/False/Not Enough Information

*Write T if the sentence is true, F if it is false, and NI if there is not enough information in the text for you to decide. Change the false sentences to make them true, or explain why they are false. Do all of the **True/False** exercises in the lessons this way.*

- ____ 1. Bering left St. Petersburg ahead of Chirikov.
- ____ 2. It took them seven years to cross Siberia because they were traveling on horseback.
- ____ 3. Vitus Bering was from St. Petersburg.
- ____ 4. Bering spent two years exploring the east coast of Siberia.
- ____ 5. Bering's and Burke's expeditions were similar.
- ____ 6. Bering's men found Eskimos in Alaska.
- ____ 7. Scurvy is caused by a lack of vitamin C.

___ 8. Alaska belonged to the United States at the time of Bering's expedition.

e Comprehension Questions

Paraphrase your answers. This means that you should answer the questions in your own words instead of using the exact words from the text.

1. Why was Bering's trip called a scientific expedition?
2. What did the men on the expedition do in Tobolsk?
3. Where did they stay longer, in Tobolsk or in Yakutsk?
4. Why did the expedition have to build boats?
5. How did the two ships lose contact in the Pacific Ocean?
6. Why did the men on the island continue to die even when they had food water?
7. Is scurvy a problem on ships today? Why or Why not?
8. When Bering's expedition returned to St. Petersburg, were they welcomed as national heroes? Why or Why Not?

f Main Idea

What is the main idea of paragraph 3 (line 14-19)

- a. It took seven years to cross Siberia.
- b. The expedition explored two rivers.
- c. The expedition built their own village in Yakutsk.

g Reading

How carefully should read something? How fast should you read? The answer depends on what you are reading. Sometimes you need to read things slowly and carefully. At other times, you can read quickly, and at still other times, you can read at an average speed.

How would you read each thing below? Check (✓) the box for slowly and carefully, at an average, or quickly.

	Slowly And Carefully	At an Average Speed	Quickly
1. A letter from your parents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. A letter from your bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The textbook for a difficult science class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. An exciting mystery story	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The directions on an important exam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. A magazine article about an interesting person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Some students like to read the whole text quickly to get the general idea. Others like to start at the beginning and read each sentence carefully. You can choose the best way for you to start reading a lesson. After that, you probably need the lesson two or three more times. When you come to a word you don't know, read the sentence again or three times, to help you remember the word. It is never necessary to memorize sentence or paragraphs. That is not way to study reading.

If the text is very difficult for you, read the first paragraph two or three times, then second, and so on. Then read the whole text from beginning to end. Then you might want to read it all again.

You will probably want to read the complete text again after you have finished the whole lesson. Then test yourself on the vocabulary words that you underlined when you first read the text and learn the words you don't know.

h Word Forms: Verbs

Every sentence must have a verb. How do you know which form of a verb to use? There are often clues that tell you what form of the verb to use.

Put the right form of the verb in each blank. Explain why you chose each form.

1. Did Bering (lead) _____ an expedition across Siberia?
2. The expedition (leave) _____ St. Petersburg in 1773.
3. Bob is (study) _____ about explorers.
4. Nadia has (learn) _____ a lot of words this week.
5. Can you (help) _____ me with this exercise?
6. The teacher (give) _____ a lot of homework every day.
7. Mr. Gordon was (sleep) _____ at midnight last night.
8. They are going to (travel) _____ in Europe next summer.

i Prepositions

The best way to learn how to use the right preposition is by practicing. Write the prepositions in these sentences from the text.

1. _____ 1773, the most complete scientific expedition in history _____ that time left St. Petersburg.
2. The Scientist planned to report _____ everything.
3. The expedition had to cross Siberia _____ order _____ reach the Pacific Ocean.
4. Vitus Bering, the leader _____ the whole expedition, left St. Petersburg _____ almost 600 people.
5. They traveled mostly _____ flat-bottomed boats _____ the rivers.
6. They had only one summer instead _____ two years _____ their explorations because _____ the many problems and delays.
7. At last, the sailors _____ Bering's ship saw mountains a short distance _____ the sea.

8. They were _____ a place _____ no trees, but there were birds and animals _____ food.
9. _____ this time, The Russian government had lost interest _____ the North Pacific.
10. It discovered a new part _____ North America.



Guided Writing

Write one of these two short compositions.

1. You are one of the men who left the island in the spring of 1742. Tell what happened to you during the decade from 1733 to 1743. Give a few details.
2. The reading does not say what happened to the people on Chirikov's ship after the two ships lost contact. What do you think happened to them?

LESSON

4

Robert Scott: A Race to the South Pole



Before You Read

1. What does this photograph tell you about the geography of the South Pole?
2. What would you need in order to explore the South Pole?
3. What problems might explorers in the South Pole have?

Context Clues

The words in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. Robert Scott led an expedition to Antarctica for a scientific **organization** called the Royal Geographical Society.
2. On earlier expeditions, when the dogs became **weak**, the men killed them for food.
3. Scott had the bad luck of having **extremely** bad weather. It was often -40°C (minus 40 degrees Celsius).
4. Scott and his men spent the winter near the ocean. They used sleds to carry supplies farther **inland**.
5. The men became **exhausted** and had difficulty pulling their sleds.

4 Robert Scott: A Race to the South Pole

The first Person to reach the South Pole was Roald Amundsen, a Norwegian. Robert Scott, Who was English, arrived at the South Pole a month after Amundsen died on the return journey to his ship. Yet, strangely enough, Scott became a hero, but Amundsen did not.

Captain Robert Scott (1868-1912) was an officer in the English navy. From 1901 to 1904, he led an expedition to Antarctica for a British scientific **organization** called the Royal Geographical Society.

His group traveled farther south than anyone else had ever done. He gathered information on rocks, weather, and climate, and he made maps. When he returned to England, he was a national hero.

A few years later, Scott decided to organize another expedition. He said that he wanted to make a complete scientific study of Antarctica, but his real goal was to be the first person at the South Pole. He took three doctors, several scientists, and a number of other men with him.

Scott's group sailed on ship named the *Terra Nova* in June 1910. When they reached Australia, They learned that Amundsen was also on his way to the Pole.

Amundsen and Scott were very different from each other, and they made many different plans. Amundsen planned everything very carefully. He took sleds and dog teams, as the great Arctic explorers did. Scott took ponies (small horses) and few dogs, but he planned to have his men pull the sleds themselves for most of the trip. On earlier expeditions, as some dogs became weak, the men killed them for food for themselves and other the other dogs. Amundsen did this too, and it helped him reach the Pole, but later people called him "dog eater". Scott would not eat his dogs, and this was one reason he died on this expedition.

not strong

There were other differences between the two expeditions. Amundsen sailed 100 kilometers closer to the Pole than Scott did. Scott also had the bad luck of having **extremely** bad weather-days of **blizzards** and strong winds. It was often -40°C (minus 40 degrees Celsius).

storms with wind
and snow

Scott and his men built a base camp near the ocean's **edge** and spent the winter there. They used sleds and ponies to carry a ton of supplies farther **inland** to a place that they named the One Ton Depot. When spring came, a few of the men started ahead of the others with motorized sleds to leave supplies along the way.

toward the interior

However, after only a few days, the motorized sleds **broke down**, and the men had to pull them.

A few days later, Scott started for the South Pole with a few men. The whole journey was very difficult. Scott and his men either walked through deep snow or skied over ice and **uneven** ground. The climate was too difficult for the ponies, and they all died. There were frequent snowstorms. Sometimes the men couldn't leave their tents for several days because of blizzards.

not flat

When Scott was 260 kilometers from the Pole, he sent all but four men back to the base camp. This was probably his most serious **mistake**. His tent was big enough for only four people, and he had only enough food and **fuel** for four. Somehow we had to **provide for** four people plus himself. Also, one man had left his skis behind with some of the supplies. He had to walk in the snow, and this slowed down the whole group.

take care of

On January 17, 1972, Scott and his men reached the Pole, only to find a tent and the Norwegian flag. They were not the first people to reach the South Pole. They had lost the race.

The next day, they started the 1,300-kilometer journey back to their base camp, pulling their heavy sleds full of supplies. The trip back was worse than the trip to the Pole. They became weak from hunger. **At times**, the whiteness everywhere made them **blind**. Their fingers and toes began to freeze, and two of the men fell and injured themselves. They didn't have enough fuel to keep warm in their tent. They become **exhausted** and had more and more difficulty pulling their sleds.

sometimes

not able to see

Finally, one man died. Then another become so weak that he knew he was **endangering** the lives of the others. One night, he left the tent and never returned. He walked out into the blizzard to die instead of holding back the other three.

causing danger to

Every day, Scott described the terrible journey in his diary. On March 21, the three remaining men were only twenty kilometers from the One Ton Depot, but another blizzard kept them in their tent. On that day, Scott wrote his last words in his diary.

A search party found the three **bodies** eight months later. They also found Scott's diary, excellent photographs of the expedition, and letters to take back to England. The search party left the frozen bodies where they found them.

Today, the base camp building is still there. Inside are supplies, furniture, and the men's **belongings**. They have been left just the way they were when Scott's expedition was there. New Zealand takes care of the building and its contents.

Robert Scott's names **lives on** in stories of his trip to Antarctica, the last part of the Earth that people explored. He was not the first to reach the South Pole, but he is remembered as one of the great heroes of exploration.

continues to live

a Vocabulary

organization	body	weak	inland
edge	blizzard	broke down	exhausted
blind	extremely	fuel	at times

1. A _____ is a storm with wind and snow.
2. He put the glass too close to the _____ of the table, and it fell off.
3. A baby has more bones in her _____ than an adult has. That's because many of our bones grow together as we age.
4. People who grow up near the sea are often unhappy if they have to move _____.
5. A _____ person cannot see.
6. It's very cold in northern Canada, but at the North Pole it's _____ cold.
7. His car _____, and he had to walk five miles to get home.
8. _____, Burke rode horseback. At other times, he walked.
9. People need _____ to cook and to heat their home.
10. The United Nations is an important international _____.

b Vocabulary

weak	provided	inland	exhausted
broke down	lives on	uneven	mistake
belongings	edge	endangered	bodies

1. It was a _____ to drive into city. There were so many cars on the road that we were an hour late for the meeting.
2. When I am travelling, I keep my _____ in a suitcase.
3. If you don't eat for several days, you will probably feel quite _____.
4. When I was a child, my parents _____ me with everything I needed.
5. The floor is so _____ that we can't put a table on it.
6. Ali stayed up all night to study for a test, and in the morning he was _____.
7. She _____ her own life when she jumped off the boat.

8. A famous person's name often _____ in books and articles.
9. Is the city of Boston on the coast or _____?
10. The _____ of a knife is very sharp.

C Vocabulary Review: Antonyms

Match each word in the left column with its opposite in the right column.

- | | |
|--------------------|--------------------|
| _____ 1. remote | a. take apart |
| _____ 2. leave | b. exterior |
| _____ 3. get along | c. close to a city |
| _____ 4. join | d. fight |
| _____ 5. run away | e. together |
| _____ 6. include | f. having |
| _____ 7. uneven | g. leave out |
| _____ 8. separate | h. remain |
| _____ 9. interior | i. come back |
| _____ 10. lacking | j. smooth |

d Multiple Choice

1. The first person to reach the South Pole was _____.
 - a. English
 - b. French
 - c. Norwegian
2. Scott was mainly interested in _____.
 - a. being the first person at the South Pole
 - b. collecting information about the rocks in Antarctica
 - c. learning about the weather and climate in Antarctica
3. Amundsen's expedition ate dogs because _____.
 - a. this is a custom in Norway
 - b. it was a way for the men to have fresh meat
 - c. there was no other food
4. Scott's expedition had to travel _____.
 - a. a shorter distance than Amundsen's
 - b. the same distance as Amundsen's
 - c. farther than Amundsen's

5. January is a _____ month in Antarctica.
 - a. summer
 - b. fall
 - c. winter
6. Scott's trip to the Pole was difficult. The trip back was _____.
 - a. more difficult
 - b. about the same
 - c. winter
7. Scott and his men became exhausted because _____.
 - a. they didn't have enough fuel and could never get warm
 - b. the sun on the snow blinded them
 - c. they didn't have enough food and had to pull heavy sleds.
8. We know the details about Scott's expedition because _____.
 - a. he sent reports back to the English government
 - b. he kept a diary and search party found it
 - c. he wrote detailed letters back to England

e Comprehension Questions

1. Scott and Burke led expeditions in very different climates. What was similar about their expeditions?
2. Explain one serious mistake that Scott made.
3. Why did Scott travel from his base camp to the Pole in January?
4. Why did one man walk out of the tent into the blizzard and not return?
5. Why was it difficult for the men to pull the sleds on the trip back from the Pole?
6. Why couldn't the three men travel the last twenty kilometers to the One Ton Depot?
7. Was Scott a hero of exploration? Give a reason for your answer.

f Main Idea

What is the main idea of paragraph 7 (lines 39-46)?

- a. Moving supplies inland
- b. Getting ready to ski to the South Pole.
- c. Bad luck with motorized sleds.



Word Forms: Noun

There are three parts of a sentence that always have a noun (or a pronoun): the subject, the object of the verb, and the object of the preposition.

<u>Subject</u>	<u>Verb</u>	<u>Object of the verb</u>	<u>Object of a preposition</u>
David-Neel	rode	a horse	to Tibet
The expedition	took	food	for the animals .
A storm	drove	the ship	onto an island

The subject is usually at the beginning of a sentence. The object of the verb is usually right after the verb. It answers the question "What?" The object of a preposition comes after the preposition. There might be adjectives and other words that describe these nouns.

David –Neel rode a large black **horse** to **Tibet**.

The large scientific **expedition** took a lot of **food** for the **animals**.

A bad **storm** drove the large sailing **ship** onto a small **island**.

Choose a word form from line 1 of the chart to use in sentence 1, and so on. Use the right verb forms and singular or plural nouns. There are empty spaces on the chart because there are not four forms for every word.

Verb	Noun	Adjective	Adverb
Include	Inclusion	Inclusive	Inclusively
Separate	Separation	Separate	Separately
Exhaust	Exhaustion	Exhausting	
Realize	Realization		
Remind	Reminder		
Inform	Information	(un) informative	(un) informatively
Organize	Organization	Organizational	organizationally
Weaken	Weakness	Weak	weakly

1. Did you _____ a description of your new friend when you wrote to your family?
2. Write your two compositions on _____ pieces of paper.
3. He spent a long time in desert. He suffered from heat _____.
4. After Ms. Cook got home, she _____ that she had forgotten to mail her letters.
5. Ms. Barber put a _____ on the refrigerator for her children to do their homework.

6. Kumiko asked the teacher for _____ about the city buses.
The teacher gave her schedule that was very _____.
7. An _____ in Melbourne chose Burke to lead an expedition across Australia.
8. He felt _____ before he started taking the medicine, and now the medicine has _____ him even more.

h

Two-Word Verbs

Learn these two-word verbs and then fill in the blanks with the right words. Use the correct verb form. Do all of two-word verb exercises in the book this way.

run out of = use up; not have any more

work out = exercises

slow down = go more slowly

speed up = go faster

live on = have enough money to pay for necessities with

1. Cars have to _____ when they enter a city. When they leave the city, they can _____ again.
2. A lot of people like to go to a gymnasium and _____. This exercise is good for them.
3. The Lopez family adopted two children. Now they can't _____ the money Mr. Lopez gets working.
4. Scott's men were hungry because they had almost _____ food.

i

Finding the Reason

Here are some sentences about the explorers you have read about. Give a reason for each statement. The first one is done for you.

Statement	Reason
Scott and his men were cold all the time	They didn't have enough fuel
Scott went to the South Pole	
David-Neel studied Tibetan in India.	
Bering's expedition lost a lot of its food.	
Bering took scientist with him.	
Burke died on his expedition.	
Burke took camels on his expedition.	
The world knows about Burke's and Scott's expeditions.	

j

Collocations

Some words are often used together. For example, we often use word “join” with the word “organization”.

*Read the following groups of words and then use the words printed in **bold** in the sentence below.*

join a **team**

join an **expedition**

join an **organization**

join **hands**

join a **club**

join **forces**

1. Walter joined the soccer _____ because he is very good player.
2. To do this dance, everyone stands in a circle and joins _____.
3. If you join and I join _____, we'll be able to do work more quickly.
4. I'd like to join an _____ that works for peace.
5. You don't have to be a great singer to join the music. _____.

k

Guided Writing

Write one of these two short compositions.

1. You are going to lead a journey to the South Pole. What will you do differently from the way Scott did it?
2. You are the tent with Scott in March 1912. Write a message in your diary.

LESSON

5

Into the Deep: Ocean Exploration



Before You Read

1. Would you like to explore the ocean floor? Why or Why not?
2. Would you be willing to explore the ocean in the metal ball shown in the picture above? Why or why not?
3. What are some of the dangers of ocean exploration?

Context Clues

The words in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. Salt water covers **roughly** 71% of the Earth.
2. For centuries, people thought of the ocean as a travel **network**.
It was a way to get from one place to another.
3. Sailors thought the ocean was a frightening place, full of dangerous **creatures**.
4. Early diving suits allowed people to **descend** 50 feet underwater.
5. Scientist discovered underwater mountains and more than 4,000 new species.

5

Into the Deep:

Ocean Exploration

Salt water covers **roughly** 71% of the Earth's **surface**, and yet we have spent much more time exploring the Earth's mountains, forests, and deserts than studying its oceans. Scientists say that we know more about the moon than we know about our own oceans. And today, we continue to spend more money on space exploration than on ocean exploration.

Why is it that we know so little about the oceans that surround us? Perhaps it is because, for centuries, people thought of the ocean as just a travel **network**. It was a way to get from one place to another. Most ocean travelers stayed close to the coast. Their goal was not to explore the ocean but **rather** to find new trade routes for the exchange of spices and other goods.

instead; more exactly

To early sailors, the ocean was also a frightening place, full of dangerous **creatures**. They thought that, deep below, the ocean was a dark and lifeless place. Believing this, people had little **incentive** to explore the ocean depths.

Ocean exploration was also **hampered** by the conditions below the surface. The tremendous **pressure** of the water would **crush** an unprotected diver. Water temperature on the ocean floor was not inviting either. Vents or openings, on the ocean floor have temperatures as high as 254°F (254 degrees Fahrenheit) or 123°C (123 degrees Celsius).

To explore below the surface of the ocean, humans needed special equipment. Early diving suits from the late eighteenth century were not very useful. One type **enclosed** the diver's body in a **cylinder**, making it difficult to move around. A later type of diving suit replaced the large cylinder with a heavy metal **helmet**. Air from above the surface travelled through a tube into the helmet. These early diving suits allowed people to **descend** fifty feet below the ocean surface for about an hour.

cylinder



helmet



In 1872, the first ship equipped for ocean exploration set out on a four-year trip around the world. The ship had two laboratories, and it carried the most advanced scientific equipment of the time. Scientist on the ship tested the temperature and **density** of sea water. They gathered information about ocean currents and meteorology. They discovered an underwater mountain chain and more than 4,000 new **species**. The results of this expedition encourage interest in exploring farther below the ocean surface. To do this, however, divers needed better equipment to protect them from the pressure of water.

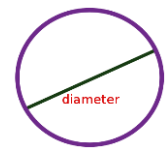
Two divers, Charles Beebe and Otis Barton, designed one of the early submersibles for deep-sea diving. It was a large **hollow**, steel ball less than five feet in **diameter** and weighing 5,000 pounds. A long heavy chain connected the steel ball to a ship above. In 1934, Beebe and Barton descended half a mile below the surface of the ocean in their submersible. From inside the steel ball, they were able to see extraordinary creatures. This was a great breakthrough for ocean exploration, for now people could see the underwater world with their own eyes.

Since Beebe and Barton's record-breaking descent, improvements have been made in diving equipment, allowing people to travel deeper for longer amounts of time. Just twenty-six years after Beebe and Barton's half-mile descent, Jacques Piccard and two others travelled to a depth of 35,797 feet, or nearly seven miles, in their own much improved submersible called Trieste. Even at this great depth, the explorers discovered deep-sea life and new species.

The work of deep-sea explorers has given us a picture of life far below the surface. There is now greater understanding of the **diversity** of life in the ocean. We are now more aware of our dependence on healthy oceans. Still, less than tenth of 1% of the deep ocean has been explored. Sylvia Earle, one of the leading experts on ocean, says, "We're in a new century and a new Millennium, and most of the planet has yet to be seen".

empty; with
nothing inside

diameter



variety

a Vocabulary

Descend	crush	hollow	enclosed
Hamper	expert	diameter	helmets
Surface	density	network	diversity

1. You can drink through a straw because it's _____ inside.
2. You need to have a hard _____ to write on.
3. Do you think it's easier to go up a mountain or to _____ a mountain?
4. It takes many years to become an _____ on something.
5. A tennis ball has a larger _____ than a golf ball.
6. If you drop a heavy weight on your foot, you might _____ it.
7. The population _____ is higher in cities than in the country.
8. Some countries require motorcyclists to wear _____.
9. Ice can _____ a ship's movement through water.
10. _____ is an important goal for many schools because there is much for us to learn from people who are different from us.

b Vocabulary

pressure	rough	rather	incentive
species	enclosed	cylinder	network
descent	expert	creature	surface

1. There are many kinds of animal _____.
2. A table has a smooth _____.
3. I don't need to know the exact time of your arrival. Just give me a _____ time.
4. They keep their dogs _____ in a large fenced area.
5. I'd like to go to the beach this weekend _____ than the mountains.
6. Employers sometimes use money as an _____ to get people to work harder.

7. At sea level, air pushes against your body with a _____ of 14.7 pounds per square inch (1kg per square centimeter).
8. Los Angeles has a huge _____ of highways.
9. A _____ cylinder has a flat circular top and bottom and straight sides
10. There was some kind of _____ living in the old building. We heard _____, but we never saw it.

C Vocabulary Review

beggar	surrounded	temperature	civil war
delayed	in order to	broke down	ashore
decade	organization	details	remind

1. The soldiers _____ the building so that no one could escape.
2. What does the smell of an orange _____ you of?
3. The snow storm _____ us for three hours because we have to drive very slowly.
4. A _____ asks people for money or food.
5. Opec is the _____ of Petroleum Exporting Countries.
6. I only know she was in an accident. I don't know any of the _____.
7. There has been a _____ in Somalia for several years.
8. Sometimes the summer _____ in Antarctica is 0°C.
9. _____ get good grades, you have to do your homework.
10. A _____ is ten years.

d True/False/Not Enough Information

- _____ 1. More than 50 % of the Earth is under water.
- _____ 2. Early sailors were afraid to explore below the surface of the ocean.
- _____ 3. In most parts of the ocean floor, the water temperature is very hot.
- _____ 4. The first diving suits were uncomfortable.
- _____ 5. The deepest parts of the ocean are lifeless.
- _____ 6. Early divers carried their own air with them.
- _____ 7. The early submersibles had motors.
- _____ 8. Jacques Piccard broke Beebe and Barton's deep-sea diving record.

e Comprehension Questions

1. Why do you think we know more about the moon than about the Earth's oceans?
2. What hampered ocean exploration for centuries?
3. What is an ocean vent?
4. What was important about the 1872 scientific trip around the world?
5. How did Charles Beebe and Otis Barton contribute to ocean exploration?
6. How far was Jacques Piccard able to descend in the ocean?
7. What have we learned from ocean exploration?
8. How are the oceans important to humans?

f Main Idea

What is the main idea of paragraph 3 (lines 15-19)

- a. Early sailors didn't have a good reason to explore the oceans.
- b. Early sailors were afraid of the oceans.
- c. No one knew what was in the ocean.

g Scanning

When you want to find just one detail in a text, it is not necessary to read carefully. You **scan** instead; that is, you look as quickly as possible until you find information.

Find these answers by scanning. Write short answers (not complete sentences). Write the number of the line where you found each answer.

1. What is the temperature at vents in the ocean floor? _____.
2. What did scientist discover in 1872? _____.
3. How much did Beebe's submersible weigh? _____.
4. What was the Trieste? _____.
5. How deep did Jacques Picard dive? _____.
6. Who is Sylvia Earle? _____.

h Word Forms: Noun

These are some common noun suffixes:

-er, -ar, -or: reminder, beggar, advisor

-ist: scientist

-ment: equipment

-ion, -sion, -tion, -ation: religion, decision, separation, realization

-y: discovery

-ity: diversity

-ness: loneliness

-ance: acceptance

Choose a word form from the chart for each sentence below. Use the right verb forms and singular or plural nouns. There are empty spaces on the chart because there are not four forms for every word.

	Verb	Noun	Adjective	Adverb
1.	trade	<i>trade</i> <i>trader</i>		
2.	<i>enclose</i>	<i>enclosure</i>	<i>enclosed</i>	
3.	<i>descend</i>	<i>descent</i>		
4.		<i>density</i>	<i>dense</i>	<i>densely</i>
5.	<i>diversify</i>	<i>diversity</i>	<i>diverse</i>	
6.	<i>rough</i>	<i>roughness</i>	<i>rough</i>	<i>roughly</i>
7.	<i>surround</i>	<i>surroundings</i>	<i>surrounded</i>	

1. Japan and America _____ with each other.
2. A lake is an _____ body of water.
3. Beebe and Barton made a _____ of half mile.
4. Steel is a very _____ material.
5. There is great _____ in the population of fish in the ocean.
6. Her father spoke _____ to her because he was angry.
7. It is not unusual for fish to _____ divers.

i

Prepositions

Write the correct preposition in each blank.

1. Salt water covers 71% _____ the Earth's surface.
2. The ocean was a way to get _____ one place or another.
3. The temperature _____ of the ocean floor varies from one place to another.
4. Diving suits _____ the late eighteenth century were difficult to move around in.
5. Air _____ above the surface traveled through a tube _____ of the helmet.
6. Scientist tested the density _____ sea water.
7. A heavy chain connected the ball _____ a ship above.
8. Even _____ this great depth, the explorers discovered new life forms.

j

Articles: The

Some geographical locations include **the** in the name.

1. Certain countries (Note that most countries do *not* include the in the name):
the United States of America, or the United States, or the U.S.A; or the U.S
the United Arab Emirates
the United Kingdom
the Dominican Republic
the Netherlands.
2. Major points on the Earth:
the North Pole
the South Pole
the equator
3. Plurals of islands, lakes, and mountains:
the Canary islands
the Great Lakes
the Himalaya Mountains
4. Oceans, seas, rivers, canals, desert:
the Pacific Ocean
the Bering Sea
the Mississippi River

the Suez Canal
the Sahara Desert

Continents, most geographical areas, most countries, and single islands, lakes, and mountains do *not* have **the** in the name:

Asia
Western Europe (but the Middle East)
England
Bering Island
Lake Geneva
Mount Everest

*Write **the** in the blank if it is necessary.*

1. _____ Panama Canal joins _____ Atlantic Ocean and _____ Pacific Ocean.
2. This canal used to belong to _____ United States.
3. _____ Kuwait is near _____ United Arab Emirates and Saudi Arabia.
4. _____ Germany, _____ Belgium, and _____ Netherlands are in _____ Europe.
5. _____ Lake Geneva is in _____ Switzerland.
6. Where are _____ Madeira Islands?
7. _____ Jordan is in _____ Middle East.
8. _____ Amazon Rivers is in _____ South America.



Guided Writing

Write one of these two short compositions.

1. Do you think we should spend more money on space exploration or on ocean exploration? Give reasons to support your answer.
2. You are in Charles Beebe's submersible in 1932. Describe what you see and feel while you are descending.

Video Highlights

a Before You Watch

1. Read the information in the box.

Throughout history, explorers have gone to remote places like the North Pole to discover new things. However, you don't need to go on a long and exciting trip to explore. The word *explore* can also mean to look at something near you very closely.

2. Try it out. Explore the room around you. What do you see, hear, and smell? Copy the chart to the right and fill in the missing information at the top of the list with at least three observations.
3. Compare your list with a partner's. Did you observe some of the same things? Which things were different?

b As You Watch

Read the phrases and sentences below. They come from the video. What do you think the video is about?

1. "In the next thirty years, everything we want to find can be found."
2. "Including a 2,000-year-old Greece shipping vessel found off the coast Cyprus."
3. "For fifteen years, the Nauticos Corporation has scoured the ocean floor looking for sunken objects."
4. "Shipwrecks, marinas, even downed planes."
5. "Divers are really only good to about ten hundred feet."
6. "Worldwide, less than two companies do this kind of exploration."

C

After You Watch

1. These words come from the video. Match them to the correct definition.

find drop drag shift identify control

- _____ a. to pull with difficulty
- _____ b. to change from one position to another.
- _____ c. to come across
- _____ d. to recognize something or someone
- _____ e. to cause to fall
- _____ f. to guide something

2. The Nauticos Corporation uses a system to find things in the ocean. Write a word from Exercise 1 to complete the sentences.

- a. _____ sonar equipment in the ocean.
- b. _____ equipment along the sea floor.
- c. _____ target.
- d. _____ to the control room.
- e. _____ remote vehicle using joystick.
- f. _____ object.

3. Describe the system Nauticos uses to find things in the ocean.

Use *first, next, then, finally*.

Example: First, they drop sonar equipment in the ocean.

4. Discuss these questions with the class.

- a. Would you like to be a deep sea explorer? Why or why not?
- b. If you were a deep sea explorer, what would you like to find on the ocean floor?
- c. Do you know of any famous shipwrecks on the ocean floor?
- d. Have you or has someone you know ever found anything valuable on the beach?

Activity Page

Adventure Trail

You and your partner are two explorers who are going to travel all over the world. Like all great explorers, you will describe the different places you travel to. You will need a coin and two counters.

Put your counters on the Home square. Each person takes a turn tossing the coin. If the coin you toss lands heads up, move your counter forward two squares. If your counter lands on a picture, describe the new place using the vocabulary words you know. Also, write two sentences about the place. Continue to toss the coin and move your counter until you reach the end (the Well Done! Square). When you have reached the end, share your sentences with the class.

START AT HOME 			EAT AT A RESTAURANT GO BACK 1 SPACE
		STAY IN A HOTEL MISS A TURN	
			
BITTEN BY A SNAKE GO BACK 3 SPACES			WELL DONE! NOW, GO BACK HOME!

Dictionary Page

Understanding Definitions

1. Draw lines to match the following two-word verb with their meanings.

- | | |
|---------------|------------------------------|
| a. get along | return |
| b. run out | be careful |
| c. work out | do a series of exercises |
| d. give up | have a friendly relationship |
| e. get back | not work at all |
| f. break down | not have any left |
| g. look out | not try anymore; surrender |

2. You can learn new two-word verbs from your dictionary. For example, these verbs all begin with **get**. Read their definitions.

21 phrasal v. (T) to get ahead: to succeed, improve oneself: *She had a good job and is getting ahead in life.*

26 phrasal v. insep. (I) to get away (from s.o.or.s.t): a. to escape: *The criminal got away from the police.* **b.** to go on vacation: *I got away for a week in the Caribbean.*

30 phrasal v. insep. To get behind: a. (T) s.o.or.s.t: To support, help succeed: *Many people got behind the politician and helped her win the election.* **b. [I] in s.t.:** to be late with one's work, payments, etc: *He got behind in his rent payments and had to leave the apartment.*

41 phrasal v. insep. To get on with s.t.or.s.o: a [T] s.t.: To start doing or continue with s.t, often after interruption: *Stop watching television and get on with your homework!* **b. [I;T] s.o.:** to have friendly relationship with: *How do you get on with your boss?*

Now write in the missing part of each verb.

- a. Donna is a friendly person. She gets _____ with everyone
- b. Try not to get _____ in your homework.
- c. The explorers caught a rabbit for dinner, but it got _____.
- d. Pierre is trying really hard to get _____. He's got a good job, he's just bought a house, and he is starting college next month.
- e. Both of us were tired and needed a break. We finally got _____ for a week at the beach.
- f. She should stop wasting time and get _____ with her work.
- g. I had an idea to increase sales. My boss got _____
The idea and sales increased 20%.

World Issues

unit 2



Our responsibility is to protect the Earth for a million years.

-Robert Hunter, environmentalist

LESSON

1

World Population Growth



Before You Read

1. How many people live in your country? In your city?
2. Think about your city with twice as many people as it has now?
How would things be different?
3. Do you want to have any children? How many?

Context Clues

The words in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. In the eighteenth century, the population of the world increased **gradually**. However, in the nineteenth century, the world's population grew very rapidly.
2. By the year 2050, researchers **predict** that the population of the world will be 9.1 billion.
3. Fresh water is **crucial** for health and food production.
4. What **effect** will 3 billion more people have on the air we breathe?
5. We don't know how long the world's supply of petroleum will **last**.

1 World Population Growth

For thousands of years, the population of the world increased **gradually**. Then, in the mid-nineteenth century, the world's population started to increase rapidly. In the 100 years between 1830 and 1930, the population of the world grew from 1 billion to 2 billion people. By 1960, just thirty years later, the world's population had hit 3 billion. Fifteen years later, the population reached 4 billion. Then, just eleven years later, there were 5 billion people on Earth. In 1999, we passed the 6 billion mark. Today, the world's population grows by 76 million people every year. That is about 240,000 people every day. But the year 2050, researchers **predict** that the population of the world will be 9.1 billion.

Does the Earth have the natural resources to support this many people? Unfortunately, the answer to this question **depends on** information we don't have. For example, we don't know how people will choose to live in the future. We don't know what their standard of living will be. We also don't know what new **technologies** will be **available** in the future.

raw materials found in nature, such as trees, oil, and natural gas

the overall quality of life that people experience

We do know that the Earth's natural resources are **limited**. Fresh water, for example, is **crucial** for health and food production. However, more than 97% of the water on Earth is salt water, which is poisonous to both people and crops. Only 3% of the water on Earth is fresh water, and three quarters of that fresh water is frozen at the North and South Poles. Today, the **demand** for fresh water is greater than the supply in roughly eighty countries around the world. By 2025, scientist predict that fort-eight countries will have **chronic** shortages of water. At present, desalinization, or the removal of salt from salt water, is not a solution to the shortage of fresh water. It takes a lot of energy to remove the salt from ocean water, and that makes the desalinization process very expensive.

long lasting

The amount of land we can use to produce food is also limited. Today, roughly 11% of the land on Earth can be used for crops, while another 20% is available for raising animals. Each year, however, more of this land is lost as cities grow and roads stretch across the land. In addition, over cultivation has **already** damaged an amount of farmland equal to the size of the United States and Canada **combined**. It is possible to increase the amount of farmland, but only a little. Some farmland can be more productive if people start using different farming methods, but this will not increase worldwide production very much.

Clean air is another important natural resource. However, it too is **threatened** by the growing population. The average person today puts about 1.1 metric tons of carbon into the atmosphere each year. Most of it comes from burning fuels—gasoline, coal, oil, wood, and natural gas. Scientists say that the amount of carbon dioxide in the air is already 18% higher than it was in 1960. What **effect** would 3 billion more people have on the air we breathe?

While we have many different **sources** of commercial energy, there is limited supply of many of them. Today, most of the world's commercial energy comes from the three **nonrenewable** energy resources: petroleum, natural gas, and coal. Three quarters of this commercial energy is used by developed countries. As the standard of living goes up in other countries, so will the demand for energy. Some scientists predict that if everyone in the world lived like an American, our fossil fuel supply would last for just fifteen more years.

solid in the
marketplace

economically strong

Clearly, the number of people that the Earth can support in the future will depend on many things. The Earth may be able to support 9 billion people, but what will their standard of living be? And what effect will all these people have on the environment?

a Vocabulary

gradually	predict	natural resources	depend on
technology	available	limited	standard of living
crucial	demand	chronic	combined

1. There is a _____ amount of oil in the Earth.
2. When automobiles first became _____ very few people could buy them.
3. If you have a _____ problem, it never goes away.
4. Some countries are poor because they have very few _____.
5. We don't yet have the _____ to supply the world with energy without using oil.
6. People are _____ learning that we must take care of the environment.
7. When there is an increase in the _____ for oil, the price usually goes up.
8. The health of the Earth _____ how we use its natural resources.
9. Researchers _____ that the use of coal will increase more than 50% over the next two decades.
10. It's _____ for everyone to have a supply of clean water.

b Vocabulary

threat	already	effect	source
commercial	developing	last	nonrenewable
combine	limit	prediction	standard

1. The population is growing faster than the food supply in many _____ countries.
2. In our town, all of the businesses are in the _____ district.
3. Wind is a renewable resource, while oil is a _____ resource.
4. It's only 8 p.m, but I'm _____ tired.
5. If you use the hot water slowly, it will _____ longer.

6. Overpopulation could be a _____ to the health of the Earth.
7. Using more solar and wind energy would have a positive _____ on the environment.
8. If you _____ salt and water, you get salty water.
9. The _____ of living is higher in some countries than in others.
10. The internet is a good _____ of information about population growth.

C Vocabulary Review

skill	rather	mistake	blind
experts	supply	surrounded	include
exhausted	civil war	species	ashore

1. Mr. Rosi was _____ after driving for ten hours.
2. For my research paper, I read many books written by _____ on air pollution.
3. Typing is very useful _____ for students. They can learn by practicing.
4. I do not use the sun to heat my house but _____ oil.
5. Alice injured her eyes in an accident. Now she is _____ .
6. There was a terrible _____ in Spain in the 1930's. Almost a million people died.
7. The demand for food and water is already greater than the _____.
8. Overpopulation is a threat to many animal _____.
9. The children _____ their teacher, who was giving away candy.
10. Many people think it's a _____ to depend on oil for our energy.

d Multiple Choice

For the rest of the book, there will be no asterisk () before any multiple-choice items. You will have to decide if the answer is in one of the sentences or if you have to figure it out yourself. In this exercise, use the text and the charts to answer the questions.*

World's Largest Urban Areas in Population (2004)

1. Tokyo/ Yokohama, Japan	31,224,700
2. New York City, U.S.A	30,107,600
3. Mexico City, Mexico	21,503,700
4. Seoul, South Korea	20,156,000
5. Sao Paolo, Brazil	19,090,200
6. Jakarta, Indonesia	18,206,700
7. Osaka/Kobe/Kyoto, Japan	17,608,500
8. Bombay, India	17,340,900
9. Los Angeles, U.S.A	16,710,400
10. Cairo, Egypt	15,863,300

World's Largest Countries in Population (2004)

1. China	1,298,847,624
2. India	1,065,070,607
3. U.S.A	293,027,571
4. Indonesia	238,452,952
5. Brazil	184,101,109
6. Pakistan	159,156,336
7. Russia	143,782,338
8. Bangladesh	141,340,476
9. Nigeria	137,253,133
10. Japan	127,333,002

1. There were ____ as many people in the world in 1930 as there were in 1830.
 - a. Twice
 - b. Three times
 - c. Four times
2. Between 1960 and 2000, the population of the world _____.
 - a. Doubled
 - b. Grew three times larger
 - c. Increased by more than a billion people.

3. About _____ of the Earth's land can be used for raising food.
 - a. 11%
 - b. 20%
 - c. 30%
4. The wind and the sun are _____.
 - a. Nonrenewable energy resources
 - b. Renewable resources
 - c. Limited energy resources
5. The amount of _____ in the air has increased since 1960.
 - a. Fossil fuels
 - b. Carbon dioxide
 - c. Natural resources
6. The developed countries use _____ commercial energy than the developing countries.
 - a. a little more
 - b. two times more
 - c. a lot more
7. Sometimes scientists predict that, by the year 2025, _____.
 - a. The population will reach 9 billion
 - b. Some countries will have serious problems getting fresh water
 - c. 11% of our farmland will be gone
8. _____ has the urban area with the largest population.
 - a. Brazil
 - b. Nigeria
 - c. Japan
9. In _____, the population of the whole world was about the same as the population of China today.
 - a. 1750
 - b. 1850
 - c. 1950
10. _____ has almost the same population as Cairo and Los Angeles together.
 - a. Mexico City
 - b. Tokyo
 - c. Seoul

e Comprehension Questions

For the rest of the book, there will be no asterisk () before any questions. You will have to decide if the answer is in one of the sentences or if you have to figure it out yourself. Use the text and charts to answer these questions.*

1. How has the population of the world changed in the past 2000 years?
2. Why is the standard of living different in different countries?
3. Can the amount of farmland on Earth be increased?
4. Why can't we use most of the Earth's water?
5. What is nonrenewable energy resource?
6. Why is the demand for energy increasing everywhere in the world?
7. Is it better to have smaller population with higher standard of living for everyone or to have a larger population with a lower standard of living?
8. How many people can the Earth support?
9. Which European country is among the world's largest?
10. Which urban area of the world has the largest population?
11. Do you think your country has too many people? Give a reason for your answer.

f Main Idea

What is the main idea of this reading? Write it in a sentence.

g Two-Word Verbs

Learn these two-word verbs and then fill in the blanks with the right words. Use the correct verb form.

Cut down = cut and remove (as in cut down a tree)

Figure out = find (the answer)

Go up = increase

Hang up = end a telephone conversation

Make up = think of a (new story or idea)

1. Mr. Hasegawa _____ funny stories to tell his children.
2. The big old tree in our front yard is dead. We have to _____ it _____.
3. I can't _____ the answer to this math problem.
4. When Tom finished talking to his friend on the phone , he said "Goodbye" and _____.
5. When there is a shortage of something, the price usually _____.

h Irregular Verbs

Memorize these verb forms. Then put the right form of a verb in each of the blanks.

Simple

freeze
forbid
sink
shoot

Past

froze
forbade
sank
shot

Past Participle

frozen
forbidden
sunk
shot

1. The law _____ driving over 40 kilometers an hour on side streets in the city. You can drive 60 or 75 on main streets.
2. A small sailboat hit a rock, and within an hour it had _____.
3. _____ food is quick and easy to cook.
4. Bob went hunting and _____ a bear.

i Word Forms

Adjectives describe nouns. They are usually before the noun. They are sometimes after the verb **be**.

These are **difficult** questions .

These questions are **difficult**.

Participles are often used as adjectives. Third form of the verb is the past participle – for example, **talked** or **frozen**. The **-ing** form of the verb is the present participle – for example, **talking**.

The world is **overpopulated**.

The **growing** population is causing environmental problems.

Choose a word from the chart for each sentence below. Use the right verb forms and singular or plural nouns.

	Verb	Noun	Adjective	Adverb
1.	Predict	Prediction	Predictable	predictably
2.	Shorten	Shortage	Short	Shortly
3.	Depend	Dependence	Dependent	Dependently
4.	Limit	Limit	Limited	
5.	Populate	Population	Populous	
6.	Care	Care	Careful/careless	Carefully/carelessly
7.	Use	Use	Useful/useless	Usefully/ uselessly
8.	Combine	Combination	combined	

1. Anne likes to read books with a ____ ending. She doesn't like surprises.

2. The secretary was _____ of paper and had to order some.

3. Many countries are _____ on oil for fuel.

4. The speed _____ in my area is 30 miles per hour.

5. What is the _____ of your country?

6. If you are _____ when you write your composition, you will probably get a good grade. If you write _____, you may fail.

7. A sled is _____ if you live in Kuwait.

8. They use a _____ of resources for energy in their house-house the sun, oil, and wind power.

j Articles

Put an article in each blank if one is necessary.

1. For thousands of years, ___ population of _____ world increased gradually.
2. By _____ year 2050, researchers predict that _____ population of _____ world will be 9.1 billion.
3. We don't know how _____ people will choose to live in future.
4. More than 97% of _____ water on Earth is _____ salt water.
5. Today, _____ demand for _____ fresh water is greater than _____ supply.
6. It is possible to increase _____ amount of farmland, but only _____ little.
7. Overcultivation has already damaged an amount of farmland equal to the size of _____ United States and Canada combined.
8. We have many different sources of _____ commercial energy.

k Guided Writing

Write one of these two short compositions.

1. Describe what your country is doing to help the world population problem. If it isn't doing anything, what do you think it should do? Why?
2. Describe life in your city ten years from now if twice as many people live there.

LESSON

2

Changes in the Family



Before You Read

1. How many people are in your family?
2. Where do the people in your family live?
3. How is your life different from your grandparents' lives?

Context Clues

The words in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. In some families, grandparents, parents, children, uncles, and other **relatives** all live together.
2. In some families, mothers stay at home to **take care of** the children.
3. Since 1970, there has been a 200% increase in the number of single-parent families. The number has increased **tremendously**.
4. **Industrialization** made it possible for many young people to move to the city to work in factories.

2 Changes in the Family

Barbara Todisco, 35, and her husband, Ted, 37, have two children. They live together in what is called a **nuclear** family. A nuclear family **consists of** two generations- two parents and their children.

is made up

Esme Tanguay, 43, lives with her daughter, Maria, 11. They live together in a single-parent family. In the United States, a quarter of American children now **grow up** in single-parent families.

Juan Diego, 45, of Miami, Florida, has two children from his marriage. His second wife, Nancy, has two children from her first marriage. Juan and Nancy also have children together. Juan and Nancy and the five children live together in what is now called a blended family.

Carl Jacobs, 32, lives with his wife, their two children, and his wife's mother and father. They are an **extended** family. Extended families consist of more than one set of parents and children. The most common type of extended family consists of a **married couple** and one or more of their married children all living together in one **household**. An extended family might also consist of two brothers and their wives and children. A large extended family might consist of grandparents, children, uncles, and other **relatives**.

For centuries, the extended family was the most common type of family. One benefit of living in an extended family is that there are more people to share the work. This was especially important in societies where mothers had to work outside the home, raising crops or gathering food. In an extended family, mothers could work outside the home while other family members were available to **take care of** the children and do other household **tasks**.

In the United States, one of the biggest changes in families in the last century has been a decrease in the number of extended families. One very important reason for this decrease was **industrialization**. The growth of industry made it possible for many young people to leave their families and move to the city to work in factories. By the 1920s, a **majority** of children in the United States were no longer living in extended families. Instead, they were living in families with a father who went to work and a mother who stayed at home.

more than half but
not all

As long as family could **afford** to have the mother stay at home, this type of family was able to survive. For many families, however, this was not **financially** possible. As the cost of living rose in the United States, more and more women needed to work outside the home. At the same time, an **emphasis** on equality for men and women opened the door to new job **opportunities** for women. Before long, single-parent families, blended families, and even extended families were becoming more common.

have enough money
(for something)

special importance
(placed on)

chances for
advancement

Since 1970, the number of single-parent families in the United States has increased **tremendously**. Today there are roughly 90 million single-parent families with children under the age of 18. That is a 200 increase since 1970. Nearly 99% of these single-parent families are headed by women. Many **sociologists** have studied single-parent families to find out why they are increasing in number. The fact that it is now easier to get a **divorce** in the United States does not fully explain this increase. In many countries, divorce rates **stabilized** in the 1980s but the number of single-parent families continued to increase. In order to get a better explanation for the increase in the number of single-parent families, it is also necessary to look at why people aren't remarrying and why there are more births outside of marriage today. These two factors are also contributing to the rise in the number of single-parent families.

Boutros Boutros-Ghali, the former Secretary-General of the United Nations, once said that families "are at the leading edge of change and are adapting to serious challenges, often under very demanding conditions". The truth is that families have always had to change and adapt, but somehow the family has always survived.

a Vocabulary

married	took care of	emphasized	opportunities
consisted of	stabilized	industrial	industry
grew up	extended	nuclear	sociologist

1. The _____ family is larger than the _____ family.
2. Her mother _____ the children while she was in the hospital.
3. When his temperature finally _____ at 100°F, the doctors were able to operate.
4. Lunch _____ salad, soup, and sandwiches.
5. Mr. and Mrs. Gorder are a _____ couple.
6. Japan is an _____ nation. It has heavy and light _____.
7. He _____ in Canada, but he spent his adult life in France.
8. Their parents _____ the importance of studying and learning, and now all the children are professors.
9. He had so many job _____ after graduate school that he had trouble deciding what to do.

b Vocabulary

divorced	afford	household	stable
majority	sociologist	task	opportunity
financial	couple	tremendous	relatives

1. Maria is from Mexico, but she has several _____ in California. Three of her aunts live there with their families.
2. Her brother was married for ten years before he got _____.
3. There are fifty students in my sociology class. The _____ of students are from United States, but there are also five international students.
4. A _____ studies how a society is organized.
5. A bank is a type of _____ organization.
6. The car I saw costs \$10,000, but I can _____ to pay only \$7,000. I guess I'll have to find a cheaper car.

7. I need a _____ of dollars, not just one.
8. My father grew up in a _____ of twelve people.
9. My least favorite household _____ is washing dishes.
10. In my opinion, a house with eight bedrooms is a _____ house.

C Vocabulary Review: Definitions

Match each word with its definition.

- | | |
|---------------------|---------------------------------------------|
| _____ 1. blizzard | a. instead |
| _____ 2. inland | b. living things |
| _____ 3. rather | c. worse |
| _____ 4. Belongings | d. stop running or working |
| _____ 5. Remain | e. things you own |
| _____ 6. Creatures | f. bad snow and wind storm |
| _____ 7. Expert | g. make a guess |
| _____ 8. Break down | h. stay in one place |
| _____ 9. Depend on | i. someone who knows a lot
about subject |
| _____ 10. Predict | j. away from the ocean |
| | k. need |
| | l. better than |

d True/False/Not Enough Information

- _____ 1. A blended family consists of one parent.
_____ 2. A nuclear family is smaller than an extended family.
_____ 3. Parents and children are from the same generation.
_____ 4. The family has changed because of industrialization.
_____ 5. A single-parent family and a blended family both have more than one generation.
_____ 6. In the 1920s, most children in the United States lived in blended families.
_____ 7. The best way to raise children is in nuclear family.
_____ 8. There is just one reason why the number of single-parent families has increased.

e Comprehension Questions

1. What is nuclear family?
2. What is blended family?
3. What is one benefit of living in an extended family?
4. What is one effect that industrialization has had on families?
5. How are families changing in your country?

f Main Idea

What is the main idea of paragraph 5(lines 25-33)? Write it in a sentence.

g World Forms: Adjectives

These are some common adjectives suffixes: **-able, -al, ful, -ive, -less, -like, -ous, -t, -y.**

Choose a word form from the chart for each sentence below. Use the right verb forms and singular or plural nouns.

	Verb	Noun	Adjective	Adverb
1.	socialize	society	Social	Socially
2.	industrialize	industry industrialization	industrial	industrially
3.	marry	marriage	marriageable	
4.	afford		affordable	affordably
5.	control	control	(un)controllable	(un)controllably
6.	limit	limit	limitless (un)limited	
7.	separate	separation	separable (in)separable	
8.	depend	dependence	dependable	dependably

1. Industrialization causes serious _____ problems in a country.
2. Many countries are trying to _____ their economies.
3. When his daughter reached a _____ age, he sent her to live with his sister.
4. For many people, a car is not _____.

5. If you drive too fast, you might lose _____ of the car. The car will become _____.
6. The supply of petroleum in the Earth is not _____.
7. The two children are _____. They start crying when they can't be together.
8. The last person who worked here was not _____. He said that he would do things, but he didn't always do them.

h Articles

Put articles in the blanks if they are necessary.

1. They live together in _____ single-parent family.
2. In the United States, _____ quarter of American children grow up in _____ single-parent families.
3. Juan and Nancy also have _____ child.
4. In _____ extended family was _____ most common type of family.
5. In _____ extended family, _____ mothers could work outside _____ home.
6. One of _____ biggest changes in _____ families in _____ last century has been _____ decrease in _____ number of _____ extended families.

i Summarizing

A **summary** of a paragraph gives all the important information in the paragraph. It is usually just one sentence. A summary of a complete reading text has a few sentences.

Choose the best summary sentence for each paragraph.

1. Paragraph 4
 - a. Carl Jacobs lives in an extended family that consists of his wife and children and his wife's parents.
 - b. There are different kinds of extended families, but they all consist of more than one set of parents and children.
 - c. Extended families consist of more than one set of parents and children.

2. Paragraph 6

- a. One of the biggest changes in American families has been the decrease in the number of extended families.
- b. By the 1920s, most American children lived in nuclear families.
- c. The growth of industry in the United States caused a decrease in the number of extended families and an increase in the number of nuclear families.



Guided Writing

Write one of these two short compositions.

- 1. In your country, how are the family lives of you and your friends different from the family lives of your grandparents when they were young? Give examples.
- 2. Right now, do you live in a nuclear, blended, single-parent, or extended family? What do you think your family life will be like in the future? What kind of family will your children and grandchildren live in? Why do you think this?

LESSON

3

Women and Change



Before You Read

1. In your country, do girls and boys get the same education?
2. Who does most of their work in your house?
3. How many women work in the government of your country? What do they do?

Context Clues

The words in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. Many reports have been **published** on rights of women.
2. The reports have a lot of good news, but they also have some **negative** news.
3. Women do **nearly** 66% of the world's work.
4. Many programs help women, **as well as** men, improve their standard of living.

3 Women and Change

“Women hold up half the sky” This is an old Chinese saying. However, research suggests that perhaps women do more than their share of “holding up the sky”.

Many reports have been **published** on the conditions and right of women **throughout** the world. Some of the news in the reports is very **positive**. For example, 90% of all countries have **official** organizations to improve the lives of women. More than half of the countries have laws to protect the rights of women, and 90% of all countries gave **passed** laws to give women equal pay for equal work. WHO (World Health Organization) and UNICEF (United Nations International Children’s Emergency Fund) have programs to improve the health of people in developing countries, **especially** women and children. Birth-control methods are now available to more than half of the women in the world. Almost half of the children in school now are girls, a big change from the past, because in many countries education was not available to girls.

The reports also have **negative** news. Although most countries have official organizations to improve women’s lives, many of these organizations don’t do anything. Women make up 50% of the world’s population, but they do nearly 66% of the world’s work. They do most of the **domestic** work- for example, cooking and washing clothes. Millions of women also work outside the home. They have become 50% of the workforce in many countries. For this work, however, they earn about half as much as men, and, of course, they earn nothing for their domestic work.

almost

total number of
people working

naturally; clearly

Reports also show that there are still very few women in high government **positions**. In fact, only about 15% of the positions in government are held by women. Being **illiterate** doesn't mean people are not intelligent. However, not being able to read and write does make it more difficult for people to change their lives.

jobs; places

In developing countries, where three quarters of the world's population lives, women produce more than half of the food. In Africa, 80% of all **agricultural** work is done by women. In some parts of Africa, this is a typical day for a woman. At 4:45 a.m., she gets up, washes, and eats. It takes her a half hour to walk to the **fields**, and she works there until 3:00 p.m. She collects firewood and gets home at 4:00. She spends the next hour and a half preparing food to cook. Then she collects water for another hour. From 6:30 to 8:30, she cooks. After dinner, she spends an hour washing the dishes and her children. Finally, around 9:30 p.m., she goes to bed.

farming

fields



There are many programs to help people improve their agricultural skills. However, for years, these programs provided money and training for men but not for women. Now this is changing. International organizations and programs are helping women, **as well as** men, improve their agricultural production.

Clearly, women's lives have changed in many ways. Some of these changes have been positive, giving many women legal rights and better living conditions. Ideally, in the future, more and more women will benefit from new opportunities, good education, and legal rights.

a Vocabulary

published	official	especially	domestic
agriculture	illiterate	as well as	of course
throughout	pass	positive	nearly

1. What book company _____ this book?
2. I like all kinds of fruit, but I _____ like bananas.
3. A _____ worker does a family's housework.
4. There are many programs available to help _____ people learn to read and write.
5. Getting a new job was the most _____ thing that happened to her last year.
6. Overpopulation affects the environment _____ the standard of living.
7. In some countries, school students must _____ an exam before they graduate.
8. If you have \$9.80, you have _____ ten dollars.

b Vocabulary

official	of course	agricultural	throughout
negative	field	position	workforce
publish	passed	nearly	domestic

1. He wants to go to an _____ school to learn about farming.
2. Her 12-year-old son wanted to drive the car, but _____ she wouldn't let him.
3. They put a fence around the _____ so that the cattle couldn't leave the farm.
4. After working at several low-paying jobs, he finally got a good _____ at a bank.
5. The _____ of a country is made up of both men and women.
6. There have been wars _____ human history.
7. The child was unhappy because his teacher said something _____ about his writing.
8. WHO is an _____ organization of the United Nations.

C Vocabulary Review: Definitions

Match the words with their meaning.

- | | |
|----------------------|--------------------------------------------|
| _____ 1. relative | a. a person who studies society |
| _____ 2. divorced | b. become an adult |
| _____ 3. population | c. small job |
| _____ 4. task | d. have enough money to buy
(something) |
| _____ 5. sociologist | e. extremely tired |
| _____ 6. majority | f. person |
| _____ 7. grow up | g. number of people in an area |
| _____ 8. afford | h. way |
| _____ 9. descend | i. more than half |
| _____ 10. exhausted | j. family member |
| | k. no longer married |
| | l. go down |

d Multiple Choice

Use the text and this chart to answer the question below.

	Percentage of total Work Hours Put In by	
	Men	Women
Cuts down forests, prepares fields	95	5
Turns the soil	70	30
Plants seeds and cuttings	50	50
Hoes and weeds	30	70
Gathers crops	40	60
Carries crops home	20	80
Stores crops	20	80
Processes food crops	10	90
Cares for domestic animals	50	50
Hunts	90	10
Feeds and cares for the family	5	95

Source: UN Handbook on Women in Africa

1. According to the chart, women in Africa do about _____ of the cooking.
 - a. 50%
 - b. 70%
 - c. 90%
2. _____ of the world's countries have official organizations to improve the life of women.
 - a. All about 90%
 - b. Half
 - c. All but 10%
3. The average woman earns _____ the average man.
 - a. more than
 - b. the same as
 - c. less than
4. _____ in the world are illiterate.
 - a. More men than women
 - b. More women than men
 - c. About the same number of women and men
5. In Africa, _____ of the farm work is done by men.
 - a. 80%
 - b. 50%
 - c. 20%
6. An illiterate person _____.
 - a. can't think
 - b. can't speak
 - c. can't read
7. In an African village, men do about half of the _____.
 - a. weeding
 - b. planting
 - c. hunting
8. In Africa, village _____ carry most of the crops, water, and fuel.
 - a. men
 - b. women
 - c. children

e Comprehension Questions

1. What does the saying "Women hold up half the sky" mean?
2. How many countries have laws to protect the rights of women?
3. Why are more women than men illiterate?
4. Give a reason why some women work more hours than men?
5. What organizations have programs to improve the health of women?

f Main Idea

What is the main idea of this reading? Write one or two sentences.

g Scanning

Scan the reading to find answers to these questions. Write a short answer and the number of the line where you found the answer.

1. What percentages of jobs are held by women?
2. What percentage of positions in government are held by women?
3. What percentage of countries have laws about equal pay?
4. In Africa, what percentage of the farmwork do women do?
5. What percentage of children in school are boys?

h Articles

Put articles in the blanks if they are necessary.

1. This is _____ old Chinese saying.
2. Some of _____ news in _____ countries have _____ official organizations to improve _____ lives of women.
3. For example, 90% of all _____ countries have _____ official organizations to improve _____ lives of women.
4. Almost half of _____ children in _____ now are _____ girls.
5. _____ millions of women also work outside _____ home.
6. More than half of _____ people who can't read and write are _____ women.
7. In _____ Africa, 80% of all agricultural work is done by _____ women.



Word Forms

There is always a noun after an article. There might be an adjective before the noun.

Women do most of the **housework**.

An illiterate **person** cannot read and write.

Choose a word from the chart for each sentence below. Use the right verb forms and singular or plural nouns.

	Verb	Noun	Adjective	Adverb
1.	publish	publication publisher	published	
2.	pass	passage		
3.		(il) literacy	(il) literate	
4.	position	position		
5.		agriculture	agricultural	agriculturally
6.		official	official	officially

1. *Newsweek* is a popular _____.
2. The government _____ a law requiring equal pay for equal work. The _____ of this law made many people happy.
3. _____ is not a problem in Japan.
4. For the photograph, he _____ himself between his two daughters.
5. Very few people work in _____ northern Russia. It is not an _____ area.
6. My brother is a government _____. He says you can't get into a government building without _____ papers.



Connecting Words

Use the word **but** to connect a sentence from the second column with one from the first column. Use a comma before **but**. Write the new sentences on a separate piece of paper column. Use a comma before **but**. Write the new sentences on a separate piece of paper.

- | | |
|------------------------------------------------------|-------------------------------------------------------|
| 1. Some of the news in the reports is positive. | a. Only 41% go to school. |
| 2. Half of the world's children are girls | b. They can use the most natural resources. |
| 3. Many women work outside the home. | c. It can be increased only a little. |
| 4. Rich countries have The fewest people. | d. Some of it is bad. |
| 5. It is possible to increase the amount of farmland | e. Most of it is salt water. |
| | f. Their husbands don't help them with the housework. |



Guided Writing

Write one of these two short compositions.

1. Is it easy to change the life of women in a society? Give reasons for your answer.
2. In your country, is the life of a young woman today different from the lives of young women fifty years ago? Give examples.

LESSON

4

Rain Forest



Before You Read

1. Do you have forest in your country? Describe them.
2. Compare the number of trees in your country today with the number of trees there 100 years ago. Do you think there are more trees, fewer trees, or about the same number?
3. What do you already know about tropical rain forest?

Context Clues

The words in bold print below are from the lesson. Use context clues to guess what each word means.

1. People cut down a quarter of the trees to make fields for their cattle. They cut down the **remaining** trees for fuel or to sell the wood or to start farms.
2. The world needs more food, and it seems like a good idea to **clear** the rain forests and use the land of agriculture.
3. One **surprising** thing about rain forests is that the land under them is not very good. Most people think it is, but it isn't.

4 Rain Forest

Tropical rain forests are found in Amazon **region** of South America, as well as in Central America, Africa, and Asia. Almost half of the rain forests are in Brazil. Tropical rain forests are very old, thick forests where it rains more than 1.8 meters per year. The oldest rain forest in the world is in Sarawak. It is 10 million years old, and it has 2,500 different kinds of trees.

In rain forests, there are huge trees forty-five meters high. The lowest **branches** of the trees are about ten meters above the ground. Below the trees, there is another **level** of plants that consists of many kinds of smaller trees, shrubs, and flowers.

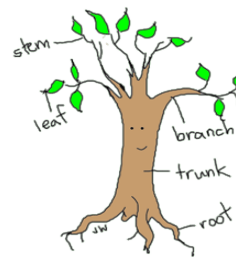
Each level of the rain forest is its own world. The lower level is protected by the trees above. The temperature and **humidity** (the amount of water, or **moisture**, in the air) stay about the same in the level. There is not much sunlight. In the upper level, the sun, rain, and wind change the temperature and humidity often.

An amazing animal world lives in the upper level. There are monkeys, members, of the cat family, birds, and insects **such as** bees, butterflies, and many kinds of flies. Other animals that usually live on the ground also live here- mice, ants, and even earthworms.

This upper level of the forest is thick with plant life because three trees are covered with other plants. Most plants get **nutrients** from the ground **through** their **roots**. These plants in the upper level take their nutrients from the trees they live on and from the other plants that die there.

The animals in the forest need “streets” so that they move along the upper level without going down on the ground. They make **paths** along the branches of the trees. A researcher found a path that stretched for eighteen meters for one tree. One kind of tiny ant makes a path only three millimeters wide.

area



for example

food

narrow ways for walking

The population in cities all over the world is growing, and more and more wood is needed to build huge new buildings. For example, 5,000 trees from the Sarawak rain forest in Malaysia were used to build just one tall building. If people continue cutting down that many trees in the Sarawak rain forest, all the trees could be gone in eight years.

The world needs more food, and it seems like a good idea to **clear** the rain forests and use the land for agriculture. Many people think that the land under these huge, thick forests must be very rich in nutrients, but it isn't. This is another **surprising** thing about rain forests.

Most of the land in tropical rain forests is very poor. The plants are able to live because of all the dead **leaves** and other plant parts that fall the ground. This **carpet** of dead plants provides nutrients for the living plants. When the land is cleared for agriculture, there are **no longer** any plants to die and provide nutrients for living plants. The cycle is broken. Agriculture is **unsuccessful** because the land cannot support it. Trees cannot grow again because the carpet of dead plants is gone. The land becomes **empty** and useless.

floor covering

not any more

Why should it **matter** to a businessperson, a farmer, or a student that people are destroying rain forests thousands of kilometers away? For anyone who takes medicine, wears running shoes, or uses envelopes, the destruction of the rainforest does matter. Rain forests cover less than 6% of the Earth's area, but they have 100,000 kinds of plants, probably half of all kinds of plants on Earth. Three fourths of all known kinds of plants and animals call the rain forest their home. Twenty percent of our different kinds of medicine come from rain forests. The glue on an envelope and in shoes comes from tropical plants. Rain forest provide materials for hundreds of other products.

Rain forests are also very important to the world's climate. The Amazon rain forest alone receives about 30 to 40% of the total rainfall on the Earth and produces about the same percentage of the world's oxygen. Many scientists believe that the decreasing size of rainforests will affect the climate on the Earth, making it uncomfortable or even dangerous for life.

The destruction of our rain forest is an international problem. One country – or even a few countries- cannot solve the problem alone. The nations of the world must work together to find a solution before it is too late.

a Vocabulary

through	path	branch	such as
destruction	region	no longer	nutrients
humidity	remain	level	roots

1. The northern _____ of Canada is very cold.
2. He plans to _____ in Brazil for several years and then return to England.
3. When students do well in their English classes, they, move up to the next _____.
4. Masako left the university to go back to Japan. She will _____ study English in an American classroom.
5. The _____ of most plants are below the ground.
6. Anne and Ken like to walk on a _____ along the rivers in the evening.
7. A _____ is a part of a tree.
8. All living things need _____ to live.
9. If you want to get to Canada from Mexico, you have to go _____ the United States.
10. The temperature and the _____ are both high in Malaysia.

b Vocabulary

cleared	surprise	nutrients	path
successful	matter	moisture	destruction
oxygen	such as	carpet	leaves

1. After dinner, they _____ the dishes from the table.
2. The living room has a wood floor, but the bedroom has a _____.
3. The _____ of the rain forests should be a concern for everyone.
4. It doesn't _____ to me is we stay at home or go to a movie.
5. _____ is necessary for life.

6. People in Latin American countries _____ Ecuador, Peru, and Venezuela speak Spanish.
7. In cold climates, trees drop their _____ in the winter.
8. He's a _____ businessperson because he works very hard.
9. It was a _____ to see him at the party because he rarely goes out.
10. The amount of _____ in the air is called humidity.

C Vocabulary Review: Synonyms

Match the words that mean the same.

- | | |
|---------------------|----------------|
| _____ 1. gradually | a. very |
| _____ 2. nearly | b. slowly |
| _____ 3. such as | c. almost |
| _____ 4. extremely | d. not old |
| _____ 5. enclose | e. about |
| _____ 6. surprising | f. for example |
| _____ 7. fresh | g. unexpected |
| _____ 8. turn into | h. become |
| _____ 9. humid | i. moist |
| _____ 10. roughly | j. surround |

d True/False/Not Enough Information

- _____ 1. Some rain forests are not in the tropics.
- _____ 2. There is more change in weather in the upper level of a rain forest than in lower level.
- _____ 3. In the upper level, some plants support the life of other plants.
- _____ 4. Plants get nutrients through their branches.
- _____ 5. People destroy about 20,000 square kilometers of tropical rain forest every year so that they can burn the wood.
- _____ 6. The land in tropical rain forests is rich
- _____ 7. Tropical rain forest land can support forests although it cannot support agriculture.
- _____ 8. Material from rain forests is used to make cassette tapes.

- _____ 9. Earthworms make paths on the branches of trees in rain forests.
- _____ 10. There are rain forests in Brazil.
- _____ 11. Rain forests have 100,000 kinds of plants.

e Comprehension Questions

1. How is the weather in the lower level of a rain forest different from the weather in the upper level?
2. Why is it amazing to find mice and earthworms in the upper level?
3. Where do most plants in the upper level get their nutrients?
4. Why do people cut down trees in the rain forests?
5. Where do plants in the lower level get their nutrients?
6. What happens to the land when the trees are cut down?
7. Why are main forests important to the world's climate?
8. What are some other reasons that rain forests are important to all of us?

f Paraphrasing

Use your own words to say the ideas found on these sentences from the text. It is not necessary to use the same number of sentences. You may use more.

1. The plants in the upper level take their nutrients from the trees
They live on and from other plants that die there.
2. When the land is cleared for agriculture, there are no longer any plants to die and provide nutrients for living plants.

g Main Idea

1. Which sentence is the main idea of paragraph 3 (lines 13-19)?
2. Write your own sentence for the main idea of paragraph 13 (lines 87-90).

h Cause and Effect

Match the causes in the first column with the effects in the second column.

Write the letter of the effect by the number of the cause.

Cause	Effect
___ 1. There are fewer rain forests.	a. The weather doesn't change much in the lower level.
___ 2. The trees are all cut down.	b. They make paths along branches
___ 3. A carpet of dead plants provide nutrients.	c. This may affect the climate of the Earth.
___ 4. Animals want to travel in the upper Level.	d. Tropical plants can live on poor land.
___ 5. The lower level is protected by the upper level.	e. Tropical land by becomes useless.

i Word Forms

Choose a word form from the chart for each sentence below. Use the right verb forms and singular or plural nouns.

Verb	Noun	Adjective	Adverb
	tropics	tropical	
humidify	humidity	humid	
moisten	moisture	moist	
empty	emptiness	empty	
destroy	destruction	destructive	destructively
surprise	surprise	surprising	surprisingly
remain	remainder	remaining	
succeed	success	successful	successfully

- Indonesia is in the _____.
- It's hot and _____ today.
- It's rainy day, and my skin is _____.
- After the children left, there was an _____ in the house.

5. War is _____. It takes human life and _____ cities, villages, and agricultural land.
6. The beauty of the forest _____ me It is a _____ beautiful places.
7. We ate half of the salad and put the _____ in the refrigerator.
8. She _____ flew the plane across the country. After her _____ trip, her friends had a big party.



Noun Substitutes

Find each word and decide what it is a substitute for. It is usually a substitute for one word, but I might be a substitute for a whole sentence.

In parts of Africa, this is a typical day for a village woman. At 4:45 a.m. she gets up, washes, and eats.

She is a substitute for **a village woman**.

1. Page 89 line 22 **their** _____
2. Page 89 line 23 **they** _____
3. Page 89 line 24 **there** _____
4. Page 89 line 31 **they** _____
5. Page 90 line 8 **it** _____
6. Page 90 line 9 **this** _____
7. Page 90 line 15 **it** _____
8. Page 90 line 22 **they** _____

k Articles

Put an article in each blank if it is necessary.

1. Below _____ trees, there is another level of plants.
2. Each level of _____ rain forest is its own world.
3. _____ temperature and humidity (amount of water, or moisten, in the air) stay about _____ same.
4. In _____ upper level, _____ sun, _____ rain, and wind change _____ temperature and humidity often.
5. Most plants get _____ nutrients from _____ ground through their roots.
6. These plants in _____ upper level take their nutrients from _____ trees they live on and from _____ other plants that die there.
7. _____ researcher found _____ path that stretched for _____ eighteen meters in one tree.
8. One kind of _____ tiny ant makes _____ path only three millimeters wide.

l Guided Writing

Write one of these two short compositions.

1. Why are rain forests important?
2. You are walking through a rain forest. Describe what you see, hear, smell, and touch.

LESSON

5

The Garbage Project



Before You Read

1. The photograph on this page shows a landfill. Based on the photograph, how would you define a landfill?
2. Where do people in your country put old cars, old newspapers, and old clothes?
3. What do you do with food that is no longer fresh?

Context Clues

The word is in **bold** print below are from this lesson. Use context clues to guess what each word means.

1. **Archaeologist** study buried houses, broken objects, and other old things to learn about ancient societies.
2. Student have to travel to **landfills**, where cities bury the things they don't want.
3. Many of things we throw away, such as newspapers, glass bottles, and some metals, are **recyclables**. We shouldn't throw them away.
4. We are in **deep** trouble. If we don't do something soon, it may be too late.
5. **Hazardous** materials contain poisonous chemicals.

5 The Garbage Project

Most **archaeologist** study buried houses, broken objects, and old **garbage** to learn important things about ancient societies. At the University of Arizona in The United States, however, archaeology students are **investigating** today's garbage. They hope to learn important things about **modern** society by studying its garbage. The Garbage Project started at the University of Arizona in 1973. Since then, students have studied of garbage in cities in the United States, Canada, and Mexico.



today's

To study the modern world's garbage, students had to travel to **landfills**, the places where cities bury their garbage, they wore special clothes and used safety equipment. Students were also very careful when they opened bags of garbage.

What have students in the garbage projects learned from studying modern garbage? One important thing they learned is that the garbage in landfills disappears very slowly. That was surprising to the students, as well as to many scientists who had predicted that roughly 70% of the garbage in the landfills would disappear naturally and quickly. Even in cities where it rains a lot, the students found newspapers from 1948, forty-year-old hot dogs, and lettuce from 1970.

The Garbage project also **revealed** that what people say they do is often very different from what they **actually** do. The archaeology students asked people what they bought, ate, and drank, and then they compared this to what people threw away. For some reason, the two didn't match. For example, the students found many more empty bottles of alcohol than people said they drank.

showed
really

Information from the Garbage Project has also helped us to see how much garbage we actually put in landfills. The students are hopeful that this will encourage us to find better ways to **dispose of** our garbage. Of course, the best way to dispose garbage depends on what kind of garbage it is: regular garbage, **hazardous** materials, or **recyclables**, such as newspapers, glass bottles, and some metals. Regular garbage goes to regular landfills. Hazardous materials, **on the other hand**, contain poisonous chemicals or metals. They shouldn't go to regular landfills.

throw away

dangerous

Ordinary houses are full of hazardous **waste**. The most problematic hazardous waste in home is **batteries**. When batteries **end up** in a landfill, they open break open. The poison inside them moves through rain water and other liquids to the bottom of the landfill. Then it can pollute the natural water in the ground. People could avoid this problem by using **rechargeable** batteries.

batteries



Another hazardous waste from homes is motor oil. When people pour old motor oil on the ground or throw it in garbage, it poisons the environment. They should recycle old motor oil instead.

Unfortunately, recycling is expensive. It takes time, equipment, and special treatment. Toronto began the first recycling program in North America in 1982. The city started by recycling newspapers and later it added glass and cans to its recycling program. When students from the Garbage Projects studied the Toronto landfills, they found that recycling was having a positive effect. Since 1982, Toronto has reduced the amount of garbage going into its landfills by 25%.

A health official once said. "We're in **deep** trouble here. We have too much garbage, our landfills are closing, and we can't open new ones because people don't want them. If we don't do something about our garbage, we're going to be buried in it." The health official made that statement in 1889! Clearly, our garbage problem is not new, but as the world's population continues to grow, it will become a bigger and bigger problem.

serious

a Vocabulary

dispose	archaeologist	hazard	investigate
waste	battery	landfill	modern
reveals	actual	hopeful	on the other hand

1. I am not very _____ that people will start recycling more of their garbage.
2. The hole in the street is a _____ to cars.
3. That light won't work without a _____.
4. I know we make a lot of garbage, but I don't know the _____ amount.
5. _____ societies produce more hazardous waste than ancient societies did.
6. An _____ needs to have a strong interest in history.
7. Bottles, paper, and cans are example of dry _____.
8. After you cut the grass, please do not put in into a bag and take it to the _____; spread it on the garden instead.
9. It is sometimes difficult to _____ an old automobile.
10. At the end of the movie, the hero _____ her true identity.

b Vocabulary

rechargeable	investigate	hazardous	on the other hand
archaeologist	end up	actually	reveal
recycle	deep	garbage	batteries

1. Don't throw that empty juice bottle away. We can _____ it.
2. They _____ there for a week , but they couldn't find anything.
3. She didn't feel comfortable with him because he asked a lot of _____ questions.
4. I could stay home tomorrow and get some work done; _____, I could take the train to visit my family.
5. Putting out fires is _____ work.
6. They said they recycled all of their newspapers, but _____ they didn't recycle any at all.

7. The _____ for my new camera are _____. I just plug them in overnight, and in the morning they are as good as new.
8. That _____ smells terrible.
9. That woman is a famous _____. She discovered an ancient city.
10. I don't want to _____ in a boring job. I hope to find an exciting job.

C Vocabulary Review: Antonyms

Match the words that mean the opposite.

- | | |
|-------------------------|--------------------|
| _____ 1. get along | a. literate |
| _____ 2. remote | b. on time |
| _____ 3. separate | c. increase |
| _____ 4. illiterate | d. under populated |
| _____ 5. roughly | e. solid |
| _____ 6. hollow | f. combine |
| _____ 7. delayed | g. nearby |
| _____ 8. no longer | h. fight |
| _____ 9. humid | i. training |
| _____ 10. decrease | j. group |
| _____ 11. overpopulated | k. exactly |
| | l. still |
| | m. dry |

d Multiple Choice

1. The Garbage Project is _____.
 a. a university program b. a type of landfill c. both a and b
2. Poisonous chemicals pollute _____.
 a. water b. wastes c. batteries
3. The Garbage project is more than _____ years old.
 a. twenty b. thirty c. fifty
4. The first recycling program in North America was in _____.
 a. the United States b. Mexico c. Canada
5. Garbage in landfills disappears _____.
 a. slowly b. completely c. quickly
6. The most serious hazardous waste in homes is _____.
 a. newspapers b. batteries c. motor oil
7. The Garbage Project showed that people _____.
 a. don't know where their garbage goes

- b. sometimes say one thing and do something else
- c. cannot change their behavior toward garbage
- 8. Hazardous waste comes from _____.
 - a. ordinary houses
 - b. factories
 - c. both a and b

e Comprehension Questions

Use the text to answer these questions.

1. Name two kinds of hazardous waste in homes.
2. Why is hazardous waste dangerous?
3. Why did students use safety equipment when they went to the landfills?
4. What is the best way to dispose of garbage?
5. What is the connection between the Garbage Project and archaeology?
6. Why did Garbage Project go to Toronto?
7. What are three things that we can recycle?
8. Do you think the problem of disposing of garbage is serious? Give a reason for your answer.

f Main Idea

1. Write a sentence that gives the main idea for the paragraph that starts on line 17.
2. Which sentence is the main idea of the last paragraph?

g Two-Word Verbs

check in	= tell the airline that you are there for the flight or tell the hotel that you are there for your room
drop out	= stop going (for example, to school)
get through	= finish
put back	= put (something) where it was before or where it belongs
think over	= think about carefully

1. I can't give you my answer right away. I have to _____ it _____.
2. You have to _____ at the airport forty-five minutes before your flight leaves.
3. Did you _____ with your homework yet?
4. David didn't finish college. He _____ after his second year.
5. Please _____ the food _____ in the refrigerator. Don't leave it out on the table.

h Compound Words

Use a word from the first column and one from the second column to make one-word or two-word compound. (More than one answer may be possible.)

- | | |
|-------------------|---------------|
| _____ 1. work | a. report |
| _____ 2. search | b. land |
| _____ 3. fire | c. bag |
| _____ 4. food | d. work |
| _____ 5. half | e. light |
| _____ 6. sun | f. place |
| _____ 7. house | g. production |
| _____ 8. research | h. party |
| _____ 9. garbage | i. wood |
| _____ 10. farm | j. way |
| | k. worker |

i Connecting Words

*Use **and** to connect a sentence from the first column with a sentence from the second column. Use a comma before **and**. Write your answers on a separate piece of paper.*

- | | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 1. Studying old garbage can teach us about ancient societies. | a. They open bags of garbage very carefully. |
| 2. Students in the Garbage Projects wear safety equipment | b. Studying fresh garbage can teach us about modern society. |
| 3. We dispose of regular garbage in regular landfills. | c. It can pollute the natural water in the ground. |
| 4. Hazardous waste contains poisonous chemicals. | d. We should dispose of hazardous waste in special landfills or by recycling. |
| 5. The poisonous inside the batteries can go to the bottom of a regular landfill. | e. We must keep it out of regular landfills. |



Main Idea

What is the main idea of paragraph 6 (lines 45-52)?



Guided Writing

Write one of these two short compositions.

1. Describe the Garbage Project. Tell what it is, who is in it, what they do and why.
2. What kind of hazardous waste do we have in our homes, and how can we dispose of it.

Video Highlights

a

Before You Watch

1. In lesson 3, you read about women in different parts of the world. Write two facts you remember about women and education.
 - a. _____
 - b. _____
2. Read the dictionary definition of *obey*. Do you always obey your parents? What happened when you disobeyed your parents? Discuss with a partner.

obey/ou'bei,ə-/v.[I;T] obeyed, obeying, obeys

to do what is asked or ordered: Soldiers obey their commander's orders.

b

As You Watch

In this video you will meet a girl named Lalita. Watch the video and decide if the sentences are true or false. If the sentence is false, correct the mistake.

- _____ 1. Lalita lives in Pakistan.
- _____ 2. Only one in four girls goes to school where Lalita lives.
- _____ 3. Lalita disobeyed her parents.
- _____ 4. She went to a village school when she was 13.
- _____ 5. Lalita went to a special boarding school when she was 18.
- _____ 6. Lalita teaches karate now.
- _____ 7. Lalita's parents are happy that she goes to school now.

C After You Watch

1. What was life like for Lalita, her parents, and her village before she went to school? What life like now? Write notes in the chart. Discuss your answers in class.

Before	After

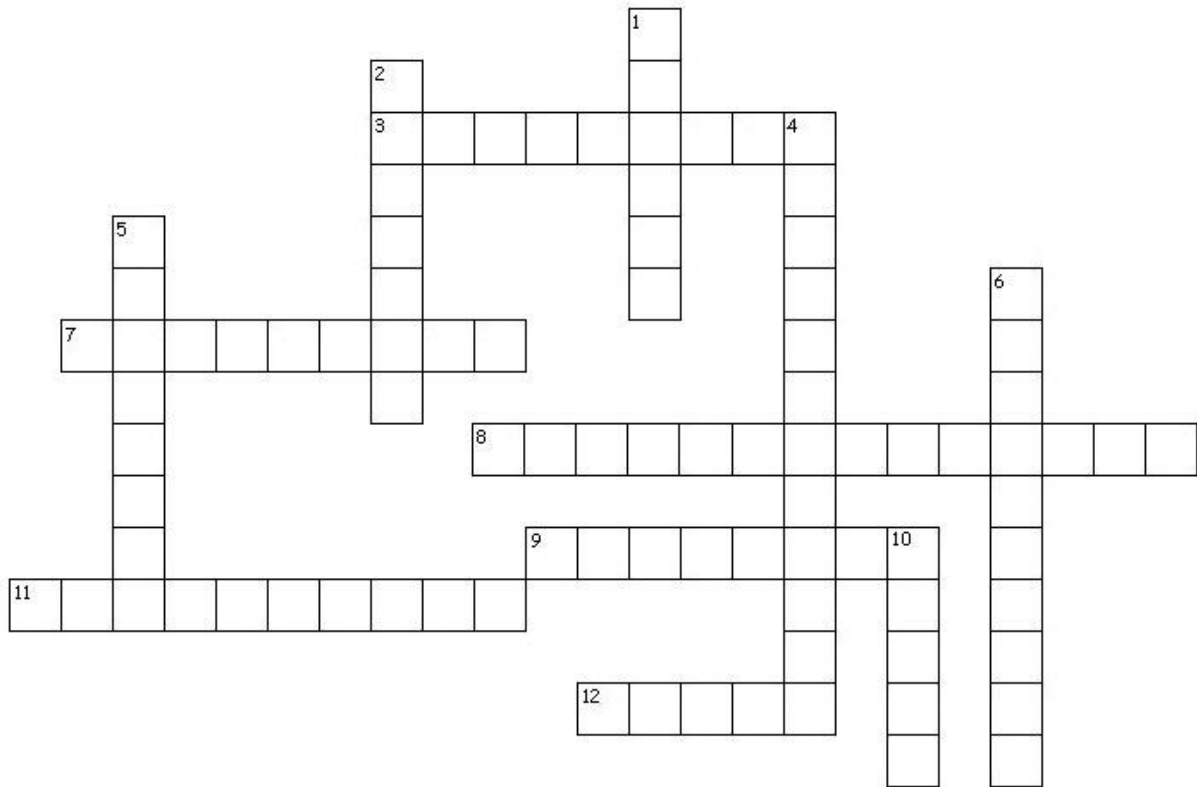
2. Circle adjectives that you think describe Lalita. Discuss in class why you choose those words.

brave	proud	clever	shy	weak
positive	successful	modern	expert	kind
normal	strong	rude	wealthy	lonely

3. Using the words in Exercise 2, write sentences describing Lalita.
Example: Lalita is proud because she helped many girls in her village.

Activity Page

Crossword Puzzle



Across

3. Another word for dangerous is _____.
7. More than half of something is a _____.
8. People who study old things are called ____.
9. The opposite of negative is _____.
11. Your aunts, uncles, and cousins are your _____.
12. The _____ of a plant are usually under the ground.

Down

1. The opposite *ancient* is _____.
2. A _____ pain is a long-lasting pain.
4. People who study how societies work are called _____.
5. Another word for *slowly* is _____.
6. An _____ person is someone who can't read.
10. The opposite of full is _____.

Dictionary Page

Working with Word Forms

1. Fill in the chart with the missing forms of each word. Write an "X" if a form does not exist. Check your dictionary if you are not sure.

Verb	Noun	Adjective
destroy	<i>destruction</i>	<i>destructive</i>
recharge		
dispose		
		surprising
	literacy	
	hazard	
	<i>protection</i>	

2. Your dictionary has sample sentences to help you understand differences in meaning. For example, *industrious* and *industrial* are both adjectives forms of *industry*. However, they are not used in the same way. Read these sentences to understand the difference:

Ali is wealthy because he is so *industrious*.

Tokyo is a modern, *industrial* city.

3. Use the information on this page to help you complete these sentences.

Example: Floods and earthquakes can cause a lot of *destruction*.

- a. Most parents will do everything they can to _____ their children from harm.
- b. A _____ person can read and write.
- c. _____ materials are dangerous.
- d. It is important for people to _____ of their waste in ways that will not harm the environment.

A Mishmash

(A Hodgepodge)



The world is so full of a number of things,
I'm sure we should all be as happy kings.

--Robert Louis Stevenson

LESSON

1

The Roadrunner



Before You Read

1. Is this bird moving fast or slowly?
2. Does the bird eat only plants and bugs?
3. Have you ever seen a bird that looks like this in real life? Or maybe on television? (hint: Beep Beep!)

Context Clues

Circle the letter of the best meaning of the **bold** word.

1. Stop talking **immediately**. This is a test.
a. In a few minutes b. right now c. soon
2. Bob received a videotape recorder as a gift from his parents on his birthday.
a. Present b. money c. package
3. This textbook has a **variety** of exercise.
a. Vocabulary b. few c. several different kinds
4. We will have the class **picnic even though** the weather isn't very nice.
a. The weather isn't nice, so we won't have the nice picnic.
b. The weather isn't nice, but we'll have the picnic anyway.
c. We won't have the picnic because the weather isn't nice.

1

The Road Runner

Beep Beep! People all over the world laugh at roadrunner cartoons, but the real bird are almost as funny as the cartoon.

The roadrunner lives in the desert **zone** of the southwestern United States and northern Mexico. It is a bird, but it can only fly about as much as a chicken can. People gave it its name because they usually see it running across a road, but, of course, it spends more time among the plants of the desert that it does on roads.

The road runner is quite a large bird---about 45 centimeters long and 25 high. People laugh when it runs because it looks so funny. It holds its head straight out in front and its tail **sticks** straight **out** in back. It takes long steps and can run 30 kilometers an hour.

It eats an amazing **variety** of food. Although it eats plants **once in a while**, it is mostly a meat eater. Most of its **diet** is insects, but it also catches birds, mice, and other small animals. It is even brave enough to catch tarantulas, **snakes**, and black widow **spiders**.

In the spring, a **male** roadrunner begins looking for a **female** as a **mate**. When he finds one, he gives her present---a snake to eat or a **twig** (a tiny branch of a tree) to use in building a **nest**. Then they build their nest, the female lays eggs, and they raise their young.

Roadrunner can also become friendly with people. One couple in Arizona feeds a pair of roadrunners that come one at a time every day and make noise outside the window. If someone doesn't give the bird a piece of hamburger **immediately**, the bird **knocks** on the window with its **beak**. Roadrunners are not **shy**.

In early spring, the bird doesn't eat the meat itself. It carries the meat to its nest to feed its young. Later on it brings the young bird to the house to beg for food itself.

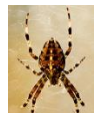
different kinds

sometimes

snake



spider

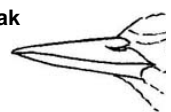


nest



right now

beak



When the woman **whistles**, the bird comes running. When the man walks out the **driveway**, the roadrunner walks along behind, like a dog or cat.

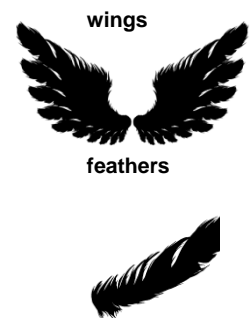
Another couple feeds a pair of roadrunners that go right into the house. They will stand on a chair or table and watch television, and they seem really interested in what is happening on the **program**. In the spring, the male sometimes brings **gifts** to the couple—a leaf or a twig for building a nest, or an insect.

In the winter, when nighttime temperatures in the dessert can be 20°C colder than during the day, the weather doesn't become warm until the middle of the morning. The roadrunner has an unusual way of keeping warm in this cold weather. In the early morning, the roadrunner stands with its back to the sun. It holds out its **wings** and lifts the **feathers** on its upper back. There is a dark **spot** on the skin under these feathers. This spot collects heat from the sun and warms the bird's body. The bird doesn't need to use a lot of **energy** to keep warm the way that most birds do.

Some people in Mexican villages use roadrunner meat as medicine. They believe that because roadrunners can eat poisonous animals and not die, their meat should be good for human sickness.

Maybe we shouldn't laugh at the roadrunner. **Even though** it looks funny when it runs, it has developed a special way to keep warm, and it can eat a poisonous animals. It can even make friends with humans. It fits into its environment very well, and it isn't important that it looks funny.

presents



a Vocabulary

variety	diet	male	female
mate	knock	driveway	feathers
even though	snakes	immediately	whistled
gift	special	stick out	couple

1. Some _____ are dangerous, but most are not.
2. A _____ connects the garage and the street.
3. There is a large _____ of food in the supermarket.
4. A woman is a _____, and a man is a _____.
5. The class is going to the museum _____ it is raining a little, and we have to walk.
6. The _____ in China is based on rice and vegetables.
7. Birds have _____.
8. Bill _____ for a taxi, and one stopped.
9. Animals look for a _____ in spring.
10. If you hear the fire alarm, leave the building _____.
11. Joan received a car from her parents as a _____ when she finished the college.

b Vocabulary

knock	programs	spot	once in a while
spider	wings	stick out	energy
diet	hazardous	feather	zones
shy	snake	nest	variety

1. An airplane has a _____ on each side so it can fly.
2. When I heard a _____ at the door, I went to answer it.
3. Mary watches television a lot, but she only goes to the movies _____.
4. An insect has six legs; a _____ has eight.
5. Don't _____ your tongue; it is very impolite.
6. Jean has a _____ on her new white jeans, and she can't get it out.

7. What television _____ do you like to watch?
8. We burn woods, gas, coal, and oil for _____.
9. Birds build a _____ in the spring.
10. The little girl was hiding behind her father's legs because she was _____.
11. The earth has several different temperature _____.

C Vocabulary Review

Match the word with their definitions.

- | | |
|-------------------------|-------------------------------|
| 1. prepare _____ | a. print and distribute books |
| 2. literature _____ | b. should |
| 3. bush _____ | c. one – fourth |
| 4. cattle _____ | d. get ready |
| 5. publish _____ | e. for example |
| 6. region _____ | f. low plant |
| 7. nonviolent _____ | g. can read and write |
| 8. cycle _____ | h. area |
| 9. be supposed to _____ | i. tropical |
| 10. such as _____ | j. cows |
| 11. quarter _____ | k. domestic |
| 12. object _____ | l. peaceful |
| | m. circle |
| | n. thing |

d True/False/Not Enough Information

- _____ 1. The roadrunner runs around the desert looking for food.
- _____ 2. Roadrunners live only in Mexico and the United States.
- _____ 3. The female gives the male gifts in the spring.
- _____ 4. A roadrunner is afraid of people and stays away from them.
- _____ 5. This bird can learn to depend on people.
- _____ 6. A big difference between daytime and nighttime temperatures is typical in the desert.
- _____ 7. A roadrunner uses a lot of energy keeping warm in winter.
- _____ 8. The roadrunner is a typical bird.

e Comprehension Questions

1. Explain why the roadrunner is not a typical bird.
2. What does a roadrunner eat?
3. Why does a male give gifts to the female?
4. Why do people laugh at the roadrunner?
5. Explain how the roadrunner gets warm in winter.
6. Do you think sick people will get better if they eat roadrunner meat?
Explain your answer.
7. Do you think it is a good idea to feed wild animals? Give a reason.
8. Explain how a roadrunner fits into its environment.

f Main Idea

Many paragraphs have a sentence that gives the main idea. It can be in different places in a paragraph.

1. Which sentence is the main idea of paragraph 4?
2. Paragraph 10?
3. Paragraph 11?
4. Paragraph 12?



Word Forms

Nouns are often used to describe other nouns. The meaning is different than when the adjective form of the same word is used.

Cuba had a **literacy** program in the 1960s.

A **literate** person can read and write.

In which sentences in this exercise does a noun describe another noun?

Choose the right word form for each sentence.

Verb	Noun	Adjective	Adverb
1.	environment	environmental	environmentally
2. complicate	complication	(un) complicated	
3. pollute	pollution	(un) polluted	
4. waste	waste	wasteful	wastefully
5. explode	explosion	explosive	explosively
	explosive		
6. depend (on)	(in)dependence	(in)dependent	(in)dependently
7.	(non)violence	(non)violent	(non)violently
8. vary	variety	various	
	variation		
9. specialize	specialty	special	especially
	specialist		
10. know	knowledge	(un)known	(un)knowingly
		knowledgeable	knowledgeably

1. Water pollution is an _____ problem.

2a. A disease can cause _____ that make the person even sicker.

2b. This is a _____ problem, and I can't find the solution.

3. Are there any _____ rivers left in the world?

4. Some _____ products from factories can be reused.

5. Some waste _____ in a landfill. The waste was made of _____.

6. Ghandi led India's _____ movement.

7. There has been a lot of _____ in Northern Ireland for several years.

- 8a. The amount of rainfall in the Australia desert _____. In some years, there is only a little, and in other years, there is a lot.
- 8b. A supermarket sells a large _____ of products.
- 8c. The “true/false/not enough information” exercises are a _____ on the “true/false exercises.”
- 9a. Most doctors _____ after they learn general medicine.
- 9b. Some words are _____ difficult to remember.
- 10a. Barbara is very _____ about birds. She knows a lot about them.
- 10b. The effect that cutting down rain forests will have on the world’s climate is _____.
- 10c. John would never _____ hurt his friend’s feelings.

h Prepositions

Put a preposition in each blank.

1. People all _____ the world laugh _____ roadrunner cartoons.
2. The roadrunner lives _____ the desert region _____ the United State and Mexico.
3. It spends more time _____ the plants _____ the desert than it does _____ roads.
4. Once _____ a while it eats plants.
5. _____ the spring, a male roadrunner starts looking _____ a mate.
6. Roadrunners can also become friendly _____ people.
7. The birds come one _____ at a time and make noise _____ the window.
8. The bird knocks _____ the window _____ its beak.
9. These birds go right _____ the house.
10. They seem rally interested _____ what is happening _____ the program.
11. _____ the winter, night time temperatures _____ the desert can be 20°C colder than _____ the day.
12. _____ the early morning, the roadrunner stands _____ is back _____ the sun.

i

Connecting Words

Connect a sentence from the first column with one from the second column with **even though**. Write the new sentence on a separate sheet of paper.

- | | |
|---------------------------------------------|------------------------------------------------------------------|
| 1. A roadrunner fits into its environment | a. They have 100,000 kinds of plants. |
| 2. The Garbage Project studies landfills | b. It is sometimes dangerous. |
| 3. Rain forests cannot support agriculture. | c. The work outside the home. |
| 4. The population is increasing rapidly. | d. Half the world's people have birth-control methods available. |
| 5. Women do most of the domestic work | e. It looks funny when it runs. |

j

Summarizing

Which sentence is the summary?

1. Paragraph 4 (lines 17 – 22)
 - a. It eats a large variety of food.
 - b. It eats both plants and meat.
 - c. It eats a large variety of food, both plants and a meat.
2. Paragraph 6 through 9 (lines 29 – 50)
 - a. Roadrunners follow people, ask for food, and watch television.
 - b. Roadrunners can become friendly with people.
 - c. Roadrunners sometimes bring gifts to people.
3. Paragraph 10 (lines 51 – 63)
 - a. Temperatures are much colder at night than during the day.
 - b. A roadrunner has an unusual way to keep warm in winter.
 - c. A roadrunner collects heat from the sun through a black spot on its back.

k

Guided Writing

Write one of these two short compositions.

1. Describe a roadrunner. Include the 3 most interesting things about a roadrunner, in your opinion.
2. Exactly how does a roadrunner fit into its environment?

LESSON

2

Afraid To Fly



Before You Read

1. How does person feel?
2. Have your ever felt like this on an airplane? Describe your experience.
3. Do you know anyone who is afraid to fly?

Context Clue

Circle the letter of the best meaning of the **bold** word.

1. The television program I watched last night was **boring**. It was so slow that I turned it off.
a. uninteresting b. interesting c. exciting
2. When the young woman saw Dracula coming toward her, she was **terrified**.
a. very happy b. very frightened c. very unhappy
3. Some people are afraid of insects, but most of them can't **harm** you.
a. hurt b. run away from c. fly onto
4. After the passengers **boarded** the plane, they put their bags under the seats and fastened their seat belts.
a. left b. saw c. got on
5. If you want to buy some stamps, you'd better **rush**. He posts office closes in 5 minutes.
a. walk b. hurry c. get some money

2 Afraid to Fly

Have you ever flown? Did you fly to another country to study English? How do you feel about flying?

People who have to fly all the time for business usually find it **boring**. People who fly only once in a while are excited. However, some people feel only **terror** when they **board** an airplane. They **suffer** from a **phobia**, an illogical **fear**.

not interesting

terror = strong fear
board = get on

If you are afraid of poisonous spiders, this is logical. If you are afraid of all spiders, even **harmless** ones, this is phobia because it is illogical. Some people have phobias about **heights** being shut in a small area, or being in a large open area. It is not logical to be afraid of these things when there is no danger, but a phobia is not logical.

not dangerous

noun for *high*

Fear of flying is another phobia. We always hear about a plane **crash**, but we don't hear about the millions of flights every year that are safe. Riding a car is thirty times more dangerous than flying, but most of us are not afraid every time we get into a car. It is not logical to be afraid of flying, but research shows that about 12 per cent of people have this fear.

People with a phobia about flying are afraid for one or more of these reasons. They are afraid of heights. They **avoid** high places, and if they are in a high-rise building, they don't look out the windows.

They might be afraid of being in an **enclosed** place like an elevator or **tunnel** on a highway. When they get on an airplane, they can't get out until end of the flight, and the flight might last several hours.

Maybe they are afraid of the crowds and all the noise and people **rushing** around at an airport. This especially **bothers** older people.

hurrying

Some people are afraid of the unknown. They don't understand the technology of flying and can't believe that a huge airplane can stay up in the air.

Others are afraid of loss of control. They need to control every **situation** they are in. When they drive a car, they have a chance of avoiding the accident. In a plane, they have no control over anything. It terrifies them to give up control to the pilot and the rest of the **crew**.

noun for *lose*

verb for *terror*

For some people, a fear of flying is not important because they don't really need to fly. But what about someone who works for an international company? What about an entertainer who has to sing in twenty different places in a month? These people have to fly if they want to continue in their **profession**.

There is help for these people. These are special classes in which people learn how to control their fear. They probably can't lose it, but they can learn to control it. Then they can fly when they need to, even though they probably won't enjoy it.

The class visits an airport and learns how airplane traffic is controlled and how planes are kept in safe condition. A pilot talks about flying through storms, the different noises an airplane makes, and the air safety in general. The class learns to relaxation exercises, and the people talk about the fear.

Next, the class listens to tape recordings of a **take-off** and landing, and later the people ride in a plane on the ground around the airport. Finally, they are ready to take a short flight.

The instructors of these classes are sometimes **psychologists**. They say that between 80 to 90 percent of the people who take them are successful. They still have their phobia, but they learn to control their fear. Some of them even learn to enjoy flying.

teachers

a Vocabulary

terror	height	fear	rush
situation	crew	takeoff	tunnel
harm	board	phobia	enclosed

1. The people who work on airplane and ships are called_____.
2. Tom found himself in a difficult _____ and he didn't know what to do.
3. A _____ is an illogical fear of something.
4. _____ is a strong word for fear.
5. _____ is the feeling you have when you are afraid.
6. When you are in a hurry, you _____.
7. Some dogs bite, but most of them won't _____ anyone.
8. Passengers check in at the airport. Then they _____ the plane.
9. After _____, the plane crew usually brings around drinks and food.
10. Some people become terrified when they are in an _____ space.
11. What is the _____ of the tallest building in your city?

b Vocabulary

boring	suffer	tunnels	losses
terrified	profession	bother	psychologist
last	instructor	crash	avoid

1. Many people in Africa _____ from hunger.
2. Anne was _____ when she saw a car coming straight at her.
3. What is your _____? Are a doctor?
4. Ali's company suffered so many _____ that he went out of business.
5. An _____ is a teacher.
6. A plane _____ usually kills a lot of people.
7. David's composition had very few mistakes, but it was _____ to read.
8. When you have a cold, try to _____ giving it to your friends.
9. There are several _____ under the rivers from Manhattan Island to New Jersey and the other parts of New York.

10. Please don't _____ me now. I'm busy.
11. How long does this class _____, an hour or less?
12. A _____ can help you learn to control your fear.

C Vocabulary Review

Cross out the word that does not belong with the other two.

1. Stick out, diet, cut down
2. Once, couple, pair
3. Feather, knock, wing
4. Plateau, cloud, mountain
5. Even, even though, although
6. Often, sometimes, once in a while
7. Pollution, surroundings, environment
8. Quarter, two-thirds, 40 percent
9. Ant, butterfly, bee
10. Relatives, females, ancestors

d Multiple Choice

1. _____ usually think flying is boring.
 - a. People who fly once in a while
 - b. People who fly often
 - c. People who have a phobia about flying
2. A phobia is _____.
 - a. Harmful
 - b. Illogical
 - c. Chemical
3. About _____ percent of people are afraid to fly.
 - a. 6
 - b. 12
 - c. 15
4. A person with fear of enclosed places doesn't like _____.
 - a. walking on a path
 - b. high places
 - c. being in a tunnel

5. _____ especially bother old people.
 - a. Crowd at airports
 - b. High-rise buildings
 - c. Spiders
6. A fear of flying is not important to some people because _____.
 - a. They are entertainers
 - b. They don't need to fly
 - c. They can take a class about flying
7. The instructor of a class for people who are afraid of flying _____.
 - a. Explains about airplane crashes
 - b. Learns to relax
 - c. Takes them to an airport
8. More than _____ percent of people who take these classes are successful.
 - a. 12
 - b. 80
 - c. 90

e Comprehension Questions

1. Have you even flown? If you have, when was the last time you flew?
2. What are two phobias?
3. Why are we not afraid when we get into a car?
4. Give four reasons people are afraid of flying.
5. Give four examples of people who need to fly.
6. What do people learn in a class for people who are afraid of flying? Tell three things.
7. The class learn how airplane traffic is controlled. How does this help people who are afraid of flying?
8. Why does the class learn about the different noise a plane makes?
9. How do relaxation exercises help the people in the class?

f Main Idea

1. Which sentences is the main idea of paragraph 8 (lines 38-41)
2. Paragraph 11 (lines 55-60)
3. Write a sentence for the main idea of the last paragraph.



Word Forms: Adverbs

Adverbs describe verbs. They also describe adjectives or other adverbs. Many adverbs end in **-ly**, for example, **badly**, and **nicely**. But there are a few adjectives that also end in **-ly**, for example, **friendly** and **lovely**. There are also common adverbs that do not end in **-ly**, such as **fast** and **hard**.

Please return to the office **immediately**.

Your solution to his math problem is **completely** wrong

Ali work **especially** hard today.

Ann is a **friendly** person.

Mike works **hard** at his job.

Sometimes an adverb or an adverbial phrase describes the whole sentence. It is followed by a comma.

Most **importantly**, you must hand in a report of the meeting by tomorrow.

Ordinarily, the class finishes at 2:00. Today it lasts until 2:30 because have a special lecture.

Verb	Noun	Adjective	Adverb
1. poison	poison	poison	poisonous
2. avoid	avoidance	(un)avoidable	(un)avoidably
3. bore	boredom	boring	boredly boringly
4. suffer	suffering		
5. fear	fear	fearful fearless	fearfully fearlessly
6. lose	loss	lost	
7. terrify	terror terrorist	terrified terrifying	

- Mr. Smith _____ his rich wife so he could have all her.
- It is _____ for beginning students to make mistakes in English.
- Students in an English program do not suffer from _____.
- There is a lot _____ in a poor countries.
- Superman is _____.
- The Student Union has a _____ and Found office. If you are lucky, you might go there and find something that you left in the cafeteria by mistake.

7. Two _____ hijacked an airplane and made the pilot fly on Paris. The passengers were _____.

h Articles

Write an article in each blank if one is necessary.

1. _____ people who have to fly all _____ time for business usually find it boring.
2. However, some people feel only _____ terror when they board _____ airplane.
3. They suffer from _____ phobia, _____ illogical fear.
4. If you are afraid of _____ poisonous spiders, this is logical.
5. Some people have _____ phobias about _____ heights, being shut up in _____ small area, or being in a _____ large open area.
6. We always hear about _____ plane crash, but we don't hear about _____ millions of _____ flights yearly that are safe.
7. They avoid _____ high places, and if they are in _____ high rise building, they don't look out _____ windows.
8. They might be afraid of being in _____ enclosed places like _____ elevator or _____ tunnel on _____ highway.
9. When they get on _____ airplane, they can't get out until _____ end of _____ flight, and _____ flight might last several hours.
10. Maybe they are afraid of _____ crowds and all _____ noise and _____ people rushing around at _____ airport.

i Connecting Words

Find a sentence in the second column that goes with a sentence in the first column. Connect the two sentences with and, but, or even though. Use a comma before and or bu. Write the sentences on a separate piece of paper.

- | | |
|-------------------------------------------------|------------------------------------------------------|
| 1. Business people are bored with flying | a. She was a Victorian woman. |
| 2. A roadrunner fits well into its environment. | b. It looks funny. |
| 3. Kingsley travelled in West Africa by herself | c. Amundsen had arrived there first. |
| 4. The boat was caught in a bad storm | d. People who don't fly very often find it exciting. |
| 5. Scott reached the South Pole | e. It sank. |

j

Summarizing

Write a sentence to summarize each of these paragraphs. Number 2 will have a long sentence. Write a sentence with only the most important idea for numbers 1 and 3.

1. Paragraph 3 (lines 9 – 16)
2. Paragraph 5, 6, 7, 8, and 9 (lines 25-47)
3. Paragraph 10 (line 48-54)

k

Guided Writing

Write one of these two short compositions.

1. Do you have any phobias? Describe one. If you wanted to control it, how would you do it.
2. Describe the most terrifying trip you have ever taken, on an airplane or any other kind of transportation.

LESSON

3

What Is Jazz?



Before You Read

1. Have you ever listened to a band like this? Where? Did you enjoy the music?
2. Do you play a musical instrument?
3. Do you read music?

Context Clues

Circle the letter of the best meaning of the **bold** word.

1. The president has to **analyse** the situation carefully before he can make a decision, so he needs to get every piece of information that he can.
 - a. Think carefully about every detail of a situation.
 - b. Get a general idea of the main situation.
 - c. Find out why something happened.
2. Thomas Edison **invented** the electric light.
 - a. figured out
 - b. discovered
 - c. made the first one
3. A journalist **interviewed** a couple who feed a roadrunner. After she had talked to the couple, she wrote an article about the interview for a magazine.
 - a. asked someone questions on a subject
 - b. gave a lecture
 - c. went to visit
4. My neighbour's child says he did not take the money that was on my table. I believed him because he is very **honest**.
 - a. usually tells the truth
 - b. gave a lecture
 - c. tells the truth and never steals.
5. It is hard to stay calm when your basketball team needs only one point to win and there are just thirty seconds left in the game.
 - a. unexcited
 - b. complicated
 - c. explosive

3

What Is Jazz?

Paul Giroux is a musician and teacher. The author asked him to **analyze** the interesting subject of **jazz** in an **interview**. In this report of the interview, N.N. **stands for** the author's name and P.G. are Mr. Giroux's **initials**.

N.N.: Before we walk about jazz, what is music?

P.G.: Music is sound as organized by ordinary people, **folks** like you and me. We describe music using words like **rhythm**, **pitch**, volume, and kind of sound.

N.N.: You used the word "folks." What is "folk" for music?

P.G.: I agree with the great jazz **trumpeter** Louis Armstrong, who said, "All music is folk music. I haven't ever heard a horse sing a song."

N.N.: (Laughing) Well, then, what is "jazz"?

P.G.: We'll get to that soon. First, we need to define those musical words. Rhythm is the feeling in the body when you hear the regular, strong beat of music, such as **drum** beat. You tap your foot or clap your hands when listening to a band, or you dance. Folks were dancing long before any history was written. Even dogs and horses dance to musical beats. Pitch is high or low. Women's voices are high. Men's are low. Volume is loud or soft. The kind of sound comes from the **instrument** used. We blow into wind instruments like the trumpet. We use our hands and fingers on the **violin** or guitar. We hit the drum, the **cymbal**, and the **piano**.

N.N.: When did people start to make music?

P.G.: No one knows. Maybe a mother's soft sounds to her baby became a song. Scientists have discovered bone trumpets which were made very long ago. Ancient fighters in the Middle East made trumpets out of sheep's **horns**. In India and Africa, and also among Native Americans, distant tribes talked to each other by



drum



violin



cymbals



piano



horn

drum beats, which soon became dance music. In China, Turkey, and ancient Rome, groups walked together using the rhythmic beat of cymbals. Cymbals and drums are in all concert and dance bands. Long ago in West Africa, village musicians hit pieces of wood which were pitched from high to low. They named this instrument the *malimba*. Americans said that word incorrectly, so it became *marimba*.

N.N.: Isn't that what Lionel Hampton played?

P.G.: No, not exactly. Hampton played a newer form of it called the vibraphone. Lionel Hampton was **hired** by Benny Goodman in 1936 and in this way became the first African-American to play with a white American group.

N.N.: Wasn't Lionel Hampton a jazz musician?

P.G.: Yes, he was.

N.N.: Then that brings us back to jazz?

P.G.: It surely does. As Quincy Jones, another African-American musician said in 1993, "Jazz is more than just music. It's a feeling. "Jazz makes us want to dance. For a long time in the United States, people thought jazz was not **respectable** music. The word jazz comes from a West African language. Jazz music has interesting rhythms and **improvisation**. That word means playing music the player **invents**, or makes up, while playing or singing.

N.N.: Do you mean that the player uses **imagination**?

P.G.: Yes. **As long as** the player is improvising, he is making up jazz. If we understand jazz in the way, one of the great jazz players was the composer J.S. Bach more than 300 years ago. Perhaps you could listen to a recording of Bach's "Jesu, Joy of Mans' Desiring." About 100 years ago, African-Americans in New Orleans in the United States began to play in a way called *ragtime*. Ragtime became mixed with Irish songs, Scottish dances, religious music, and African drum beats, and the result

if, also while

was jazz. Musicians in France in the early 1900s used jazz in their music. Maybe you could listen to a recording of the French composers Debussy's "Golliwog's Cakewalk."

N.N.: When did jazz become popular in the United States?

P.G.: It became popular about 10 years before World War II. And after that war, in the 1950s, Benny Goodman was playing jazz to large crowds in Tokyo, Bangkok, Singapore, and Hong Kong.

N.N.: Was Duke Ellington playing in New York at that same time?

P.G.: Yes, and for many years before.

N.N.: What can you tell us about Duke Ellington?

P.G.: Like Lionel Hampton and Quincy Jones, Duke Ellington was an African-American musician. The Duke **honestly** said he was not a jazz musician but a piano player. Much of his music is not for dancing. with truth

N.N.: Does the **character** of jazz change with the player?

P.G.: Yes, some jazz is exciting. We call it hot. Another kind of jazz is cool and **calm**. not excited or
angry, peaceful

N.N.: Is jazz, then, an **original** American art form?

P.G.: Yes, it is. Jazz music has gone from the United States to all over the world. Musicians from many other countries are bringing their own ideas of jazz music to the United States. For example, in the early 1990s, a jazz group from England called the Bluesbreakers was playing in the United States. Also, from East India, Ravi Shankar, a musician who improvises on an East Indian guitarlike instrument called a *sitar*, plays in the U.S. In Beijing, Cairo, Tel Aviv, Cape Town, Istanbul, Bombay, Manila-----almost everywhere, it is easy for the traveller to find a jazz club for dancing.

a Vocabulary

honestly	drums	horns	respectable
jazz	analyze	interviews	initials
character	pitch	improvised	original
volume	rhythm	pollution	waste

1. The _____ of the authors of this book are P.A and N.N.
2. Your idea is _____. No one ever thought of it before.
3. Companies try to hire people who work _____. They try to hire people with a good_____.
4. Ahmed needed to fix his car in a hurry, but he didn't have exactly the right equipment, so he _____.
5. I can't sing that part because my voice is too low. Let Flo sing it. Her voice has a higher _____.
6. All rock bands have _____.
7. Television news programs often have _____ with famous people.
8. Camels do not have _____.
9. Dr. Gomez will use her computer to _____ her search.
10. My father plays in a _____ band.
11. No _____ person would go to that terrible place.
12. Please turn down the _____ on the TV. I'm talking on the telephone.

b Vocabulary

stand for	folk	trumpet	calm
instrument	invented	violin	cymbal
as long as	hire	imagination	piano

1. A guitar is a musical _____.
2. You play a _____ by hitting it with w stick.
3. Some people will travel anywhere _____ they don't have to fly.
4. Most people have to sit down when they play the _____.
5. Ms. Davis tried to stay _____ even though she was very worried about her daughter.

6. Sometimes in the army, soldier wake up to the sound of a _____ or bugle.
7. What does U.S. _____? The Unites States.
8. The Bakers are going to _____someone to do their domestic work.
9. The person who _____ the typewriter had a wonderful idea.
10. A _____ looks a little like a guitar.
11. Children use their _____ when they play.
12. A “_____tale” is a story that people in a country or area have told to their children for hundreds of years.

C Vocabulary Review

branches	level	root	earthworms
stretch	glue	moisture	nutrients
flies	direct	explosion	peaceful
spot	snakes	whistle	gift

1. I have to _____ these papers together.
2. It bothers me when _____ come around the food at a picnic.
3. Some _____ are poisonous _____are not, even though they have a similar shape.
4. Maria is at the highest_____ in the English program.
5. When we eat a carrot, we are eating the _____ of the plant.
6. Some food provides more _____than other food.
7. Leaves grow on the _____ of trees.
8. Some people can _____ songs very well.
9. Desert animal don't drink much water. They get it from the _____in plants.

d True/False/Not Enough Information

- _____ 1. The character of jazz changes with the player.
- _____ 2. A music analyst can tell one kind of music from another.
- _____ 3. Sounds need organization by people to become music.
- _____ 4. Animals can feel drum beats in their bodies.
- _____ 5. When a car starts slowly and goes faster and faster, the pitch of the sound it makes goes from high to low.
- _____ 6. A fire alarm makes a high-volume sound.
- _____ 7. A long time ago, people made musical instruments out of animal parts.
- _____ 8. Lionel Hampton, Quincy Jones, Benny Goodman, and Duke Ellington are names of famous jazz musicians.
- _____ 9. A jazz musician must play the music exactly as it is written on the paper, the same every time.
- _____ 10. Hot jazz and cool jazz are different in character.

e Comprehension Questions

1. Explain three words we use to describe music.
2. What does imagination mean?
3. How does Quincy Jones explain jazz?
4. What is marimba?
5. Where did the word jazz come from?
6. Where did people first play "ragtime" music?
7. What musical instrument did Duke Ellington play most?
8. What is the difference between hot jazz and cool jazz?
9. What is the most important characteristic of jazz/
10. When can you go to hear jazz today?

f

Paraphrasing

Use your own words to say the same ideas as these sentences from the text. It is not necessary to use the same number of sentences. You may use more.

1. Music is sound as organized by ordinary people, folks like you and me.
2. As long as the player is improvising, he or she is making up jazz.

g

Main Idea

1. Write a sentence for the main idea for lines 33-49.
2. Write a sentence for the main idea for lines 110-122.

h

Scanning

1. We blow into _____ instruments.
2. Lionel Hampton played the _____.
3. Benny Goodman hired Lionel Hampton in _____.
4. _____ wrote "Golliwog's Cakewalk."

i

Word Forms: Active and Passive

The passive is formed with **be** and the past participle. In an active sentence, the subject performs (does) the action.

The **interviewer** asked several questions.

In a passive sentence, the subject receives the actions. Sometimes the person (the agent) who performed the action is included in the sentences after the word **by**. The agent is not included if it is unknown or unimportant. Sometimes everyone knows who the agent is, so it is not necessary to name it.

Several questions were asked by the interview.

My car was stolen last night. (I don't know who stole it.)

Society is studied so that it can be better understood. (The people who study society are not important in this sentence.)

Cars are made in factories. (Everyone knows they are made by people.)

Write the correct word form in the blanks, including active and passive forms.

Verb	Noun	Adjective	Adverb
1. instruct	instruction instructor	instructive	
2.	(dis) honesty	(dis)honest	(dis)honestly
3. imagine	imagination	(un)imaginative	(un)imaginatively
4. invent	invention inventor	inventive	
5. interview	interview interviewer		
6. characterize	character characteristic	(un)characteristic	(un)characteristically
7.	psychology psychologist	psychological	psychologically
8. beg	beggar		
9. depend (on)	dependability	(un) dependable	dependably

- 1a. The lettuce on safe driving was very _____>
- 1b. The students _____ to arrive on the time the first day of classes.
2. _____ is an important characteristic for someone working in a bank.
3. That mystery program was very _____. I didn't know how it was going to end until the last minute.
- 4a. A computer programmer has to be _____ in order to write.
- 4b. The telephone _____ by Alexander Graham Bell.
5. The Minister of Health didn't like some of the questions that the _____ asked him. He _____ by the foreign journalist.
6. Marge started a fight with her sister. This was very _____ of her because she is usually nice to her.
7. Barbara is going to study _____. The she will work with people who have _____ problems.
8. Dan _____ his friend to lend him his car.
9. Mr. Thompson is a person. You know he will what he says. You can _____ him.



Noun Substitutes

What does each noun substitutes stand for?

1. Page 133 line 1 **him** _____
2. Line 5 **we** _____
3. Line 14 **that** _____
4. Page 134 line 5 **they** _____
5. Line 7 **it** _____
6. Line 9 **it** _____
7. Page 135 line 1 **their** _____
8. line 15 **it** _____
9. Line 20 **their** _____



Articles

Write an article in each blank if one is necessary.

1. Paul Giroux is _____ musician and teacher.
2. _____ author asked _____ him to analyze _____ interesting subject.
3. In _____ report of _____ interview, N.N. stands for _____ author's name and P.G. are _____ Mr. Giroux's initials.
4. I agree with _____ great jazz trumpeter Louis Armstrong, who said, "All _____ music is _____ folk music. I haven't ever heard _____ horse sing _____ song.
5. Rhythm is _____ feeling in _____ body when you hear _____ regular, strong beat of _____ music, such as _____ drum beat.
6. _____ kind of sound comes from _____ instrument used.

Two-Word Verbs

pick someone up - go somewhere with your car and get someone.

stand for - for example, U.S. stands for the United States

see off- go with someone to the airport, for example, when he or she is going to leave.

clean up - clean the house after a party, for example, or after someone children had a lot of toys out.

help out - help

1. UN _____ the United Nations.
2. Tom had a big party. Afterward, he had to _____ the house. Three of his friends stayed to _____.
3. Ali studied at New York University for 5 years. When he left, twenty people went to the airport to _____ him _____.
4. Let's go to the party together. I'll _____ you _____ at 9:00.

m Guided Writing

Write one of these two short compositions.

1. Compare jazz with another kind of music you like. How is it the same?
2. Describe the music of your country. Tell a little about the history, the instruments, the sound, and the famous musicians.

LESSON

4

Skyscrapers



Before You Read

1. What city is this?
2. How tall is the tallest building in your country?
3. Do you enjoy going up to the tops of tall building?

Context Clues

1. New York City is famous for its **skyscrapers**. They reach up into the sky.
 - a. Art museum
 - b. wide streets
 - c. tall building
2. Carol is only 8 years old, but she loves to draw buildings. She wants to be an **architect** when she grows up.
 - a. an artist
 - b. a person who plans new buildings
 - c. an engineer
3. Mr. Smith is a **pleasant** instructor. He is friendly and helpful to all his students and to the other instructors.
 - a. nice
 - b. busy
 - c. new
4. Research shows that seat belts help **prevent** serious injuries in accidents.
 - a. stop something before it happens
 - b. have fewer accidents
 - c. hold the person in the seat
5. In the modern world, people communicate by telephone, radio, television and computer.
 - a. talk to each other
 - b. give and receive information
 - c. get the world's news

4 Skyscrapers

When people think of **skyscrapers**, they think of New York, a city with many high-rise buildings. There is no other city like New York, and this is because of its great buildings that reach up into the sky.

It comes as a surprise then to learn that Chicago, not New York, is the home of the skyscraper. The first high-rise building was built in Chicago in 1884, and it was nine stories high. This is not tall **compared** floor with today's buildings, but it was the first building over six stories. There were no tall buildings before that because the needed technology didn't **exist**.

For centuries, the tallest buildings were made of stone. The lower walls had to be thick enough to support the upper ones. If the building was very high, the lower walls had to be very thick.

Early in the nineteenth century, engineers developed **iron frames for bridges**. In the 1880s, architects started using iron and steel frames to support the walls of buildings. The buildings did not need thick walls to hold up the upper stories, so the buildings could be much taller.

There were other **advantages** to these steel frames. The building walls were thinner and could have more windows, which made the rooms much **pleasanter**. pleasant = nice With thin lower walls, there was room for stores and offices on the ground floor. It was also faster to build with an iron and steel frame than with stone.

However, there was still one problem. How would people get up to the top stories in a ten story building? We all know what the solution was—the elevator. Elisha Otis invented and first showed it to the **public** in 1853. By the 1880s, there were elevators run by electricity which were fast and lights enough to use in skyscrapers. They were developed at just the right time.

There were other problems that architects and engineers who built high-rise buildings had to solve. They had to figure out a way to get water to all the floors. They had to **prevent** the buildings from moving in the wind. **In addition**, they wanted to make them as beautiful and as possible.

At the time that architects first started **designing** and building high-rise buildings, thousands of **immigrants** were entering the United States from Europe. They all needed a place to live. Cities were growing fast, and tall buildings meant that many more people could live in a small area, so people started building skyscrapers in cities across the United States.

Over the years, the problems connected with high-rise buildings were solved. Buildings got taller and taller. In 1900, a fifty-story building was built in New York, and in 1913, one with sixty floors. In 1931, the Empire State building in New York was finished; it was 102 stories high. This was the tallest building in the world until 1970, when the World Trade Center was built, again in New York. It has 110 floors. Then the Sears Building was built in Chicago in 1974. It also has 110 stories, but it is taller than the World Trade Center.

Other countries were building skyscrapers too. In Europe, the centers of many cities were destroyed by **bombs** during World War II. The city planners rebuilt many of the buildings exactly as they had been. In addition, they included high-rises in their plans. Most European cities today are a **mixture** of old and modern buildings.

Tokyo did not have tall buildings for a long time because of **earthquakes**. Then engineers figured out how to keep a high-rise standing during an earthquake. Today there are many tall buildings in Tokyo. In fact, there are tall buildings in cities throughout the world. As the population of cities increases, the number of high-rise increases because they take less space.

movements of the
earth

And what about the future? Architects say there is no limit to the height a building can be. An engineer in New York is designing a 150-floor building. An architect in Chicago has drawings of a 210-story building.

We have the technology for these buildings, but do we need them or want them? With the invention of computers, a company doesn't have all its offices in one huge building. People can **communicate** by computer from offices **spread** out all over the city, or even from their homes. And do we want 200-story buildings? Do people want to work and live that far above the ground? A skyscraper can be dangerous in a fire, or if somebody puts a bomb in one. The architects and engineers who are planning these new skyscrapers have to think about these questions, or they may build buildings that no one will use.

exchange information

a Vocabulary

skyscraper	advantages	frame	prevent
immigrants	design	communicate	exist
compare	pleasant	in addition	connects

1. When we _____ Canadian and American English, we see that there are not many differences.
2. There are many _____ to learning English because it is an international language.
3. A high-rise building is also called a _____.
4. A driveway _____ the garage with the street.
5. Thousands of _____ arrive in Australia from Asia and Europe every year.
6. It is possible to _____ many forest fires that people start.
7. In some skyscrapers, the walls are made of a steel _____ and glass.
8. An architect _____ buildings.
9. Music has rhythm. _____, it has pitch, volume, and sound.

b Vocabulary

pleasant	mixture	bomb	spread
exist	architect	story	earthquake
advantage	communicate	prevent	public

1. Hot chocolate is a _____ of chocolate, sugar, and milk.
2. We've had _____ weather lately. It has been warm and sunny.
3. In the future, we will _____ with computers even more than we do now.
4. An _____ in Turkey destroyed several villages.
5. Dinosaurs do not _____ anymore.
6. A famous _____ designed the whole city of Brasilia.
7. The children _____ their toys all over the floor and then went to watch television.
8. Another word for the floor of a building is _____.
9. The lecture on modern architecture tonight is open to the _____. Anyone can go.
10. There was an explosion because of a _____.

C Vocabulary Review

Match the words with the definitions

- | | |
|---------------------|--------------------------------------------|
| 1. colony _____ | a. better |
| 2. interior _____ | b. half of the earth |
| 3. border _____ | c. get away from |
| 4. delay _____ | d. a place that belongs to another country |
| 5. blind _____ | e. to the shore |
| 6. superior _____ | f. line between two countries |
| 7. escape _____ | g. can't see |
| 8. hemisphere _____ | h. remote |
| 9. ashore _____ | i. inside |
| 10. blizzard _____ | j. sled |
| | k. bad winter storm |
| | l. wait |

d Multiple Choice

- The first skyscraper was built in _____.
a. Chicago b. New York c. Tokyo
- Skyscrapers did not exist before 1884 because _____.
a. steel did not exist
b. people didn't have the necessary technology
c. there were not enough immigrants to live in them
- Architects got the idea of using iron and steel frames for buildings from _____.
a. engineers b. other architects c. designers
- A building with a steel frame does not need _____.
a. technology
b. thick walls
c. stores and offices on the first floor
- The first building with sixty floors was built only _____ years after a fifty-story building.
a. 1913 b. four c. eighteen
- As population increases, _____ increases.
a. immigration b. the number of skyscrapers c. the number of old buildings

Verb	Noun	Adjective	Adverb
1. compare	comparison	comparative	comparatively
2. please	pleasure	(un)pleasant	(un)pleasantly
3. add	addition	additional	additionally
4. (dis)connect	(dis)connection	(dis)connected	(dis)connectedly
		(un)connected	
5. mix	mixture	mixed	
6.	(dis)advantage	(dis)advantageous	(dis)advantageously
7. prevent	prevention	preventive	
8. immigrate	immigration		
	immigrant		
9. popularize	popularity	popular	popularly
10. enclose	enclosure		
11. strengthen	strength	strong	strongly

1a. Spanish spelling is _____ easy to learn.

1b. By _____, English is more difficult.

2. It was a _____ to meet you.

3. People who are afraid to fly don't like being closed in _____, they sometimes fear heights and don't understand the technology of flying.

4a. What is the _____ between the changes in the family and woman's place in society.

4b. We had the phone _____ because we are moving for tomorrow.

4c. You can't put a list of _____ sentences in one paragraph.

5. Students from several countries are _____ together in one class.

6. It is _____ to learn English. Are there any _____ to learning it?

7. _____ medicine is better than helping people after they are sick.

8. The _____ office is open from 9:00 to 5:00.

9a. _____ is very important to teenagers.

9b. Paper handkerchiefs or tissues are _____ called *Kleenex*. Most people called them that.

10a. The farmer put his sheep on an _____ for the night.

10b. The university admission office included several _____ with the letter to the new student.

11a. Exercise _____ the muscles.

11b. I agree with you_____.

h Two-Word Verbs: Review

Put the right words in the blanks.

1. There was a long line waiting to check _____ at the airport.
2. A large truck broke _____ on the highway.
3. Alice goes to the gym every weekend to work _____.
4. Do you have enough money to live _____?
5. Could you help me _____ this weekend?
6. Fixing my car turned _____ an all-day job.
7. Mr. Brown is working too hard and has to slow _____.
8. Jean had to drop _____ of school and get a job.
9. Children don't like to put _____ their toys when they finish playing.
10. Bob was an hour late because he ran _____ gas.

i Articles

Put an article in each blank if one is needed.

1. When people _____ think of _____ skyscrapers they think of New York, _____ city with many high-rise buildings.
2. It comes as _____ surprise to learn that Chicago, not New York, is _____ home of _____ skyscrapers.
3. For centuries, _____ buildings were made of _____ stone.
4. How would _____ people get up to _____ up stories in _____ ten-story building?
5. Elisha Otis invented _____ elevators and first showed it to _____ public in 1853.
6. _____ Amazon River is in _____ tropics.
7. _____ people in my class are mostly from _____ Middle East.
8. _____ Bering Sea is in _____ North Pacific Ocean.
9. _____ Lake Superior is between _____ Canada and _____ United States.
10. _____ history of _____ England is complicated.

j

Summarizing

Write the sentence to summarize these paragraphs.

1. Paragraph 1
2. Paragraph 2
3. Paragraph 4
4. Paragraph 7
5. Paragraph 8
6. Paragraph 9
7. Paragraph 10
8. Paragraph 13

k

Guided Writing

Write on these two short compositions.

1. Do you think we should continue to build higher and higher buildings?
2. Describe a skyscraper you have seen. Be very specific and give complete details.

LESSON

5

Left-Handedness



Before You Read

1. What are these people doing? What hand are they using?
2. Are you left-handed, or is anyone else in your family?
3. Can being left-handed have advantages as well as disadvantages?

Context Clues

Many words have two meanings. What is the correct meaning in these sentences? Circle the letter of the best meaning of the **bold** word.

1. You can take **as long as** you want to do this test. There is no time limit.
a. if b. as much time as c. a long time
2. Mr. Rossi doesn't have enough wood to finish the table he is making. He has to buy another **board**.
a. get on a plane b. uninteresting c. flat piece of wood
3. Maria is 10 kilos overweight so she is going to **diet**.
a. eat less
b. the food someone eats
c. what a roadrunner eats
4. Environmentalists **object** landfills that pollute.
a. things b. lists c. are against
5. My brother and his wife are having family problems, but they hope they can **work** the **out**.
a. get exercise b. work hard c. solve

5 Left-Handedness

Are you a leftie? If you are, you are one of millions in the world who **prefer** to use their left hands. There would be millions more left-handed people if their societies didn't **force** them to use their right hands.

like better

To understand left-handedness, it is necessary to look at the brain. The brain is **divided** into two hemispheres. In most right-handers, the left hemisphere is the center of language and logical thinking, where they do their math problems and memorize vocabulary. The right hemisphere controls how they understand **broad**, general ideas, and how they **respond** to the five **senses**—sight, hearing, smell, taste, and touch.

separated

The left hemisphere of the brain controls the right side of the body, and the right hemisphere controls the left side. Both sides of the body receive the same information from the brain because both hemispheres are connected. However, in right-handed people, the left hemisphere is stronger. In left-handed people, it is the right hemisphere that is stronger.

Different handedness causes differences in people. Although the left hemisphere controls language in most right-handers, 40 percent of left-handers have the language center in the right hemisphere. The other 60 percent use the left side of the brain of both sides for languages.

Lefties prefer using not only the left hand. They prefer using the left foot for **kicking** a ball because the whole body is “left-handed.”

There is an increasing amount of research on handedness. For example, one psychologist says that left-handers are more likely to have a good imagination. They also enjoy swimming underwater more than right-handers do.

Left-handedness can cause problems for people. Some left-handed children see letters and words **backwards**. They read *d* for *b* and *was* for *saw*. Another problem is **stuttering**. Some left-handed children start to stutter when they are forced to write with their right hands. Queen Elizabeth II's father, King George VI, had to change from left-to-right-handed writing when he was a child, and he stuttered all his life.

repeating words
or parts of words

Anthropologists think that the earliest people were about 50 percent right-handed and 50 percent left-handed because ancient tools from before 8000 B.C., could be used with either hand. But by 3500 B.C., the tools, which were better designed, were for use with only one hand. More than half of them were for right-handed people.

people who study
different cultures

The first writing **system** invented by the Phoenicians (3000-2000 B.C.) in the Middle East, went from right to left. The Greeks began to write from left to right around the fifth century B.C. because they increasingly believed that "right" was good and "left" was bad. As time passed, more and more customs connected "left" with "bad." This belief is still **common** in many countries today, and left-handed people **suffer** because of it.

experience difficulties
or pain

As the centuries passed and education spread to more levels of society, more and more people became literate. As more children learned to write, more of them were forced to write with their right-hands. In the United States, some teachers finally started **permitting** schoolchildren to write with their left-hands in the 1930s. In parts of Europe, left-handed children were still forced to write with their right hands in the 1950s. Today in many countries, all children must write with their right hands even though they prefer using their left hands.

Some famous people were left-handed. Julius Caesar, Napoleon, Michelangelo, and da Vinci (famous Italian artist), and Albert Einstein were left-handed. Alexander the Great (356-323 B.C.) and Queen Victoria of England also were left-handed. So is Prince Charles.

Paul McCartney of the Beatles plays the guitar the opposite way from other guitarists because he's left-handed. Marilyn Monroe, the famous American movie star, was also left-handed.

Are you left-handed even though you write with your right hand? Take this test to find out. Draw a circle with one hand and then with the other. If you draw them **clockwise** (the direction of the hands of a clock go in), you are probably left-handed. If you draw them **counter clockwise** (in the other direction), you are right-handed. The test does not always work, and some people may draw one circle in one direction and the other circle in the other direction. But don't worry if you are left-handed. You are in good company.

with a lot of other
good people

a Vocabulary

divided
senses
kick

broader
responding
tool

backward
force
system

stutter
prefer
hired

1. The main streets of a city are _____ than the side streets.
Broadway is a common street name.
2. A left-handed person who is forced to write with the right hand may begin to _____.
3. A car can go forward and _____.
4. Players cannot _____ ball in basketball.
5. Would you _____ coffee or tea?
6. A blind person is lacking one of the _____.
7. Some students are shy about _____ in class.
8. The Phoenicians invented the first _____.

b Vocabulary

divided	tools	force	broad
common	counter clockwise	clockwise	permit

1. A mechanical cannot fix a car without _____.
2. Twenty _____ by four equals five. ($20 \div 4 = 5$)
3. _____ means the way the hands of a clock go.
_____ is the opposite.
4. Parents should not _____ their children to swim in the pool without
and adult there.
5. Spiders are _____ everywhere except at the North and South poles.
6. Governments cannot _____ people to limit the size of their family.

b Vocabulary Review

stick out	male	mates	nests
once in a while	boring	suffer	crash
fear	tunnel	loss	terrified

1. A man is a _____.
2. In spring, animals search for _____.
3. Spiders and birds build _____.
4. A roadrunner's head _____ straight in front when it runs.
5. The Simplon _____ goes under the Alps between Italy and
Switzerland.
6. Being afraid to fly is an illogical _____.
7. We heard a loud _____ and knew that there had been an accident.
8. Some people think baseball is _____ because it is so slow.
9. Would you be _____ to meet Frankenstein?
10. Most people only fly _____.

d True/False/Not Enough Information

- _____ 1. Some Eskimos are left-handed.
- _____ 2. Most right-handed do calculus with the left hemisphere of the brain.
- _____ 3. When people look at a beautiful building, most of them use the right hemisphere of the brain.
- _____ 4. The right hemisphere controls the right side of the body.
- _____ 5. Most people in the world use the left hemisphere for language.
- _____ 6. Left-handedness can cause children to see letters backwards.
- _____ 7. It is easier to write from left to right.
- _____ 8. Left-handed people are more intelligent than right-hander.

e Comprehension Questions

- 1. What does the right hemisphere of the brain control?
- 2. Which hemisphere is stronger in left-handed people?
- 3. Why do lefties prefer to kick with the left foot?
- 4. What problems do lefties have in using machines?
- 5. When do some left-handers start to stutter?
- 6. Why do anthropologists think the earliest people were equally divided between left-and-right-handedness?
- 7. Why did the Greeks start writing from left to right?
- 8. What does "you are in good company" mean?
- 9. How can you tell if a 2-year-old child is left-handed?
- 10. Are you left-handed?

f Main Idea

- 1. What sentence is the main idea for paragraph 4?
- 2. Paragraph 6?
- 3. Write a sentence for the main idea in paragraph
- 4. Write the main idea of the last paragraph



Word Forms

Verb	Noun	Adjective	Adverb
1. communicate	communication(s)	(un)communicative	
2. exist	existence	(non)existent	
3. prefer	preference	(un)preferential	
4. divide	division	(in)divisible	
5. force	force	forceful	forcefully
6.		(un)common	(un)commonly
7. respond	response	(un)responsive	
8. permit	permission permit	(im)permissible	(im)permissively
9.	reality	(un)real	really

- 1a. There have been many wonderful development in the field of _____ in the last twenty years.
- 1b. I tried to get the information from the president's secretary, but he was very _____.
3. Frank told everyone that he worked for a large company, but the company is _____.
- 3a. Professors should not give _____ treatment to the students they like.
- 3b. Shot jackets, not long coats, are _____ by skiers.
4. Ten is not evenly _____ by 3.
- 5a. Ms. Bush is a very _____ person.
- 5b. John _____ to leave the university because his grades were so bad.
6. It is _____ believed that sons are better than daughters.
7. The injured person _____ to the doctor's treatment. She is well now.
- 8a. Psychologists say that adult should not accept _____ behaviour from their children.
- 8b. You cannot build a house in this city without a building_____.
- 8c. Smoking _____ not _____ in this building.
9. It seemed _____ to Abdullah that he had finally finished his doctorate degree and was going home.

h Missing Words

Fill in the missing words.

1. If you are, you are one _____ millions in _____ world _____ prefer _____ use their left hands.
2. _____ understand left-handedness, it is necessary _____ look _____ the brain.
3. The brain _____ divided _____ two hemispheres.
4. Both sides of _____ body receive the same information _____ the brain because both hemispheres _____ connected.
5. There is _____ increasing amount _____ research _____ handedness.
6. But _____ 3500 B.C., the tools, which _____ better designed, were for use _____ only one hand.
7. _____ the centuries passed and education spread _____ more levels _____ society, more and _____ people became _____.
8. But _____ worry _____ you are left-handed. You are _____ good company.

i Connecting Words

Put **after**, **before**, when, **since**, or **until** in the blanks.

1. I'll give you the book _____ I see you tomorrow.
2. People who are afraid of flying can control their fear _____ they take a class.
3. The Garbage Project has been in existence _____ 1973.
4. Toronto knew it had done a good job recycling _____ the Garbage Project proved the amount of its garbage had become smaller.
5. Sometimes _____ the roadrunner gets a piece of meat, it takes it back to its nest.
6. There were no skyscrapers _____ 1884.

7. _____ Burke started across Australia, he organized the expedition.
8. Some left-handed European children were force to write their right hands _____ the 1950s.



Finding The Reason

Write the reason for each statement.

Statement	Reason
1. Many left-handers have to use their right hands.	
2. For some people, the center of language is in the right hemisphere.	
3. Both sides of the body receive the same information.	
4. Lefties prefer kicking with the left foot.	
5. King George VI stuttered.	
6. Anthropologist think more than 50 percent of people were right-handed by 3500 B.C.	
7. Paul McCartney plays the guitar differently.	



Guided Writing

Write one of these two short compositions.

1. Write a short history of left-handedness. Start with the earliest people and continue until today.
2. Your 3-year-old child is left-handed. Your friend thinks you should teach the child to use the right hand instead. What are you going to do and why?

Video Highlights

a

Before You Watch

1. How much do you remember about skyscrapers? Work with a partner to recall the following information from Lesson 4.
 - a. The American city with the most skyscrapers: _____
 - b. The building material that made tall buildings possible: _____.
 - c. Two problems that architects and engineers had to solve: _____.
2. Read the comments about the video, “Green Skyscraper.” Then, discuss the questions below with your partner.

Lights, tourists, traffic. Times Square is not where you would expect to find an environmental experiment in progress.

But, slowly rising, is a 48-story building designed to save energy and other natural resources.

- a. What do you know about New York? List three facts.
- b. Why do you think this new building is called a “green skyscraper”?

b**As You Watch**

Listen for information that will help you complete this list:

Ways the Green Skyscraper Will Save Energy

1. It will use the solar panels to generate clean _____.
2. Extra insulation will be used to keep heat (or cool air) _____.
3. Oversized _____ will let in light, but not too much heat.

c**After You Watch**

1. Check the facts. It the underlines information in the following sentences correct? If not, change the sentences to make it correct. Write your correction above the mistake. If the information is already correct, do not change the sentence.

Example:

It's going to cut energy use by ^{40%}~~80%~~ over a conventional building.

- a. The builder, architects and suppliers communicate via airmail and the Internet.
 - b. We believe we've eliminated about 40,000 sheets of paper.
 - c. The building was designed to cut down on the use of glass and other energy-intensive building materials.
 - d. Keeping buildings running takes up about one half of the energy used in America each year.
2. Why is the statement below important? Discuss it with a partner. Share your explanation with class;
"The building is going to cut energy use 40% over a conventional building.....that's significant, particularly in a building this big. That's a lot of carbon dioxide (CO2) that won't be going into the atmosphere."

Activity Page

Familiar Phrases

A *phrase* is a group of words that has a special meaning. Use this key to figure out the familiar phrases in the boxes.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A

Write each phrase on the lines, then use it in a sentence of your own.

Example:

R M

T L L W

X K N K Z M B

in good company

If you like to swim, you are in good company with fish.

1.

G Z K

B K F I

U L L G

2.

Z

S R T S

- I R H V

Y F R O W R M T

3.

L M X V

R M

Z

D S R O V

Dictionary Page

Understanding Grammar Codes

1. You can use your dictionary to learn about regular verbs.

ending	form	example
-ed	simple past	<i>They designed the building to save energy.</i>
-ed	past participle	<i>The building was designed to save energy.</i>
-ing	present participle	<i>The architects are designing a new building.</i>
-s	third person singular	<i>He designs buildings for a living.</i>

Your dictionary also gives you the forms of all irregular verbs. Look at this entry for the verb “swim”. Label each of its main forms.

2. Complete these sentences with the correct form of the verb in parentheses. Use your dictionary to check for the correct spelling.

swim /swim/ verb **swam** /swæm/ Swum / swAm/, **swimming**, **swims**
to move through the water by moving parts of the body: *He swam across the river and back again.*
to sink or swim : to do what is necessary to survive: *This company must losing money or go out of business; it's sink or swim.* ---noun (sport) swimming.
swim noun
the act of swimming: *Let's go for a swim.*

Example:

The audience (clap) clapped their hands and stamped their feet.

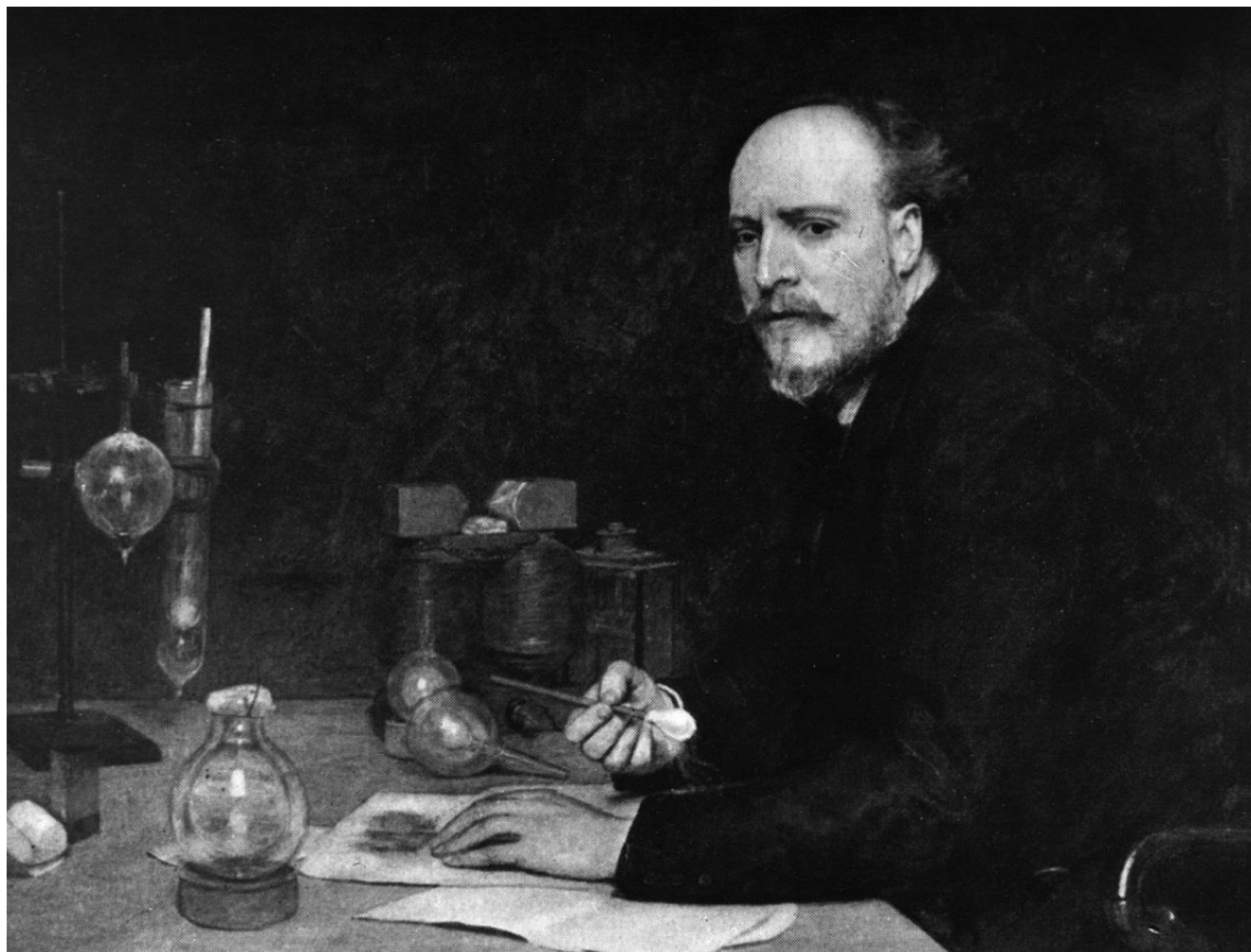
- a. I haven't ever (hear) _____ a horse sing a song.
- b. As long as a player is (improvise) _____, he is making up jazz.
- c. Jazz (become) _____ popular about 10 years before World War II.

Science

unit 4

Minds are like parachutes. They only function when they are open.

--Sir James Dewar

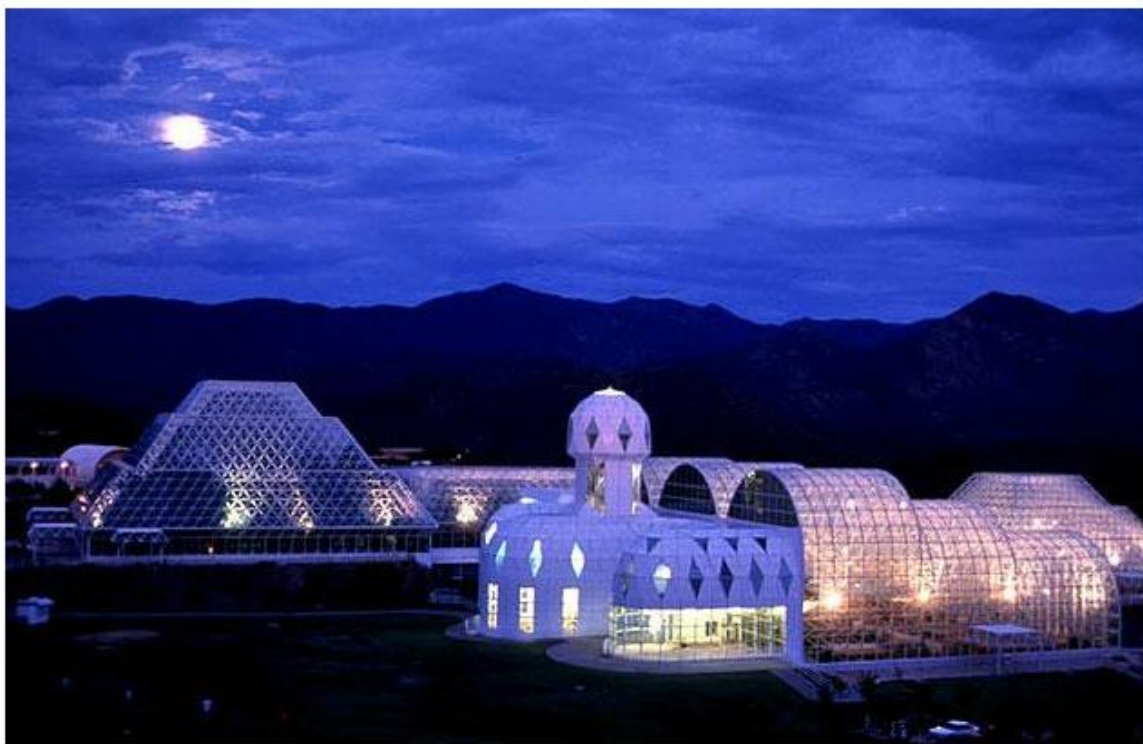


Sir James Dewar, a Scottish chemist and physicist.

LESSON

1

Biospheres in Space



Before You Read

1. What kind of building is this
2. Would you like to live in this building if you couldn't come out for 2 years?
3. Do you read stories or watch movies about traveling in space?

Context Clues

Circle the letter of the best meaning of the **bold** word.

1. A computer is a very **complex** machine.
a. beautiful b. boring c. complicated
2. Ali said he was from Palestine, but he was **actually** born in Qatar.
a. preferably b. maybe c. really
3. The members of the group **discuss** a protest to get each other's ideas.
Then they start planning.
a. talk about b. prepare c. publish
4. Pierre has studied English for 3 months **so far**. He plans to study for 6 more.
a. until now b. away from home c. altogether
5. In rain forests, dead plants **create** nutrients for living plants.
a. take away b. make c. prevent
6. More children think video games are **fascinating**. They spend hours playing them.
a. very boring b. very interesting c. unpleasant

1

Biospheres in Space

Is it possible for people for people to live on another **planet** such as Mars? **Science fiction** stories have told about space colonies for years, but they were possible only in the author's imagination. Now we are **actually** preparing for space colonies. Scientists really **consider** it possible for people to live away from the earth sometime in the future.

really

The Environmental Research Laboratory at the University of Arizona is one of the places that design biosphere (*bio* means *life*, and *sphere* is a *circle*, like a ball) which could be used to colonize other planets. They are very **complex projects**. They are complete, enclosed environments where people can be born, live their whole lives, and die without returning to the earth. There has to be a perfect **balance** among the plants, animals (including humans), and chemical **elements**; that is, among everything in the environment. Specialists on almost everything in our environment, including biologists, biochemists, and people from different areas of agriculture, work on these projects.

complicated

Biospheres might not be found. They could be square or any shape at all. There might be separate **units** for food production. These would be connected to the main unit. Architects and engineers are **discussing** all the possibilities now. Scientists have to figure out what shapes biospheres should be, what materials to use, and how small they could be and still support human life.

talking about

A greenhouse for growing plants in winter is the first step toward a biosphere. This is a closed environment except for the sun's heat entering through the glass or plastic. Of course, there is a water system from outside, and people bring in nutrients for the plants and take out the waste material. A biosphere will have to have its own system to provide water that can be used and reused. It will need **bacteria** or something else to take care of the wastes. It all must be balanced perfectly, or the whole system will breakdown.

Nothing enters a biosphere except heat from the sun and information from outside. Biospheres in space will get their information from the earth. Sometimes the information going in and out won't be necessary for the biosphere to exist but it will be very necessary for research.

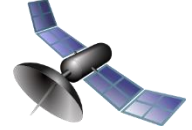
The earth itself is the best example of a biosphere. Nothing important enters except sunlight, and nothing leaves as waste except some heat. Everything in the earth's environment has always been balanced, except that now humans are destroying the balance more and more.

We want to build biospheres in space for different reasons. One reason is that there will be a petroleum shortage in the future. Dr. Gerard K. O'Neill, a famous **physicist** from Princeton University, has said that in a few years we will have satellites in space to produce solar energy and send it to the earth. It will be too expensive to send people and materials continually to the satellites, so biosphere will be necessary. He thinks 10,000 people could live in a spacer colony sometime in the future. There is another interesting reason to build biospheres. We can use them to do all kinds of research about our own environment and how it works. By studying biospheres, we can understand better what will happen as humans destroy tropical forests, as we create more **carbon dioxide** (CO₂) by burning fuel, and as we pollute the oceans and the air. The information we get from biospheres may keep us from destroying our own environment.

So far we have only a few places we call biospheres. One is in Oracle, Arizona, near Tucson and the University of Arizona. Many visitors go to see this biosphere every year. However, some scientists think the Oracle biosphere is not a very scientific project because the people inside the biosphere can get more from outside than sunlight and information. They bring in food and other supplies and change the air. They even go outside for medical treatment. In space, people living in a biosphere could not do this. Another place called a biosphere was created in 1993 near the ocean in Sonora, Mexico. It is a wonderful place for scientific research on the environment, but it is not really biosphere, either, because it is not enclosed.

Learning how to protect our own environment is the most important thing we can do, both for ourselves and for our children. The world's population is increasing very fast, and we are using up our natural resources fast. We need to everything we can to save our environment before it is too late. Biospheres are fascinating projects. Everyone hopes they will be successful.

satellite



solar = of the sun

make

very interesting

a Vocabulary

actual	planet	project	science fiction
solar	satellite	complex	recycle
unit	bacteria	consider	carbon dioxide

1. The earth is a _____. It is part of the _____ system.
2. _____ can cause disease. They also destroy wastes.
3. Tom said his new car cost \$10,000, but the _____ figure was \$9,980.85.
4. Julia likes to read _____.
5. A space colony might be all in one _____, or it might have separate ones for agriculture.
6. The government has a _____ to build a dam to store water for agriculture.
7. Another word for complicated is _____.
8. We must _____ both the advantages and the disadvantages before we start the project.

b Vocabulary

create	satellite	bacteria	carbon dioxide
so far	discussed	actually	elements
balance	project	physicist	fascinating

1. CO₂ means _____.
2. Gold (Au), oxygen (O), and uranium (U) are all _____.
3. Destroying rain forests can _____ problems for the whole world.
4. The class _____ how to prepare for the TOEFL exam.
5. _____ there are no buildings over 110 stories high.
6. A _____ teaches or does research in physics.
7. Before the large increase in population, there was a _____ between the needs of the people and what the land could produce.
8. Much international communication is now done by _____.
9. It is a _____ experience to live in another country.

C Vocabulary Review

energy	avoided	rush	crew
takes off	board	harmful	phobia
honestly	score	interview	initial

1. Please _____ this paper so I can show my teacher that you have read it.
2. After people _____ a plane, it _____.
3. What was the final _____ of the game?
4. Sometimes students have to _____ someone and write a composition about it.
5. Smoking is _____ to the health.
6. _____ is produces by burning fuel.
7. If you _____ through your work, you are likely to make mistakes.
8. Kumiko _____ giving a speech in class by staying home that day.
9. A road _____ is repairing the main street where I drive every day.
10. Betty said she _____ forgot to meet her friend for lunch Sunday.

d Multiple Choice

1. Fiction is _____.
a. True b. imaginative c. boring
2. Biospheres are complicated projects because _____.
a. everything must be perfectly balanced
b. scientist don't know what materials to build them from
c. people from different professions work on them
3. A biosphere _____ be round.
a. must b. will c. might
4. Biospheres in space could support _____ people.
a. Two or three b. ten c. 10,000
5. A greenhouse _____.
a. Is a partly enclose environment
b. Is a biosphere
c. Supports plants life independently

6. _____ might take care of the wastes in a biosphere.
 - a. A water system
 - b. Balances nutrients
 - c. Bacteria
7. Dr. O'Neill thinks _____.
 - a. satellite can produce solar energy
 - b. about ten people could take care of a satellite
 - c. we need a space colony to study the solar system

e Comprehension Questions

1. Why is it a complex project to create a biosphere?
2. What problems must the architects and engineers consider?
3. How is a greenhouse different from a biosphere?
4. Explain why the earth is a biosphere?
5. How does Dr. O'Neill think we will solve the energy shortages?
6. Why can we learn about our environment from the biosphere?
7. Would you like to live in a biosphere on Mars? Why or why not?

f Main Idea

1. Write the sentences that gives the main idea for paragraph 3 (lines 24-32).
2. Paragraph 6 (lines 50-55).
3. What sentences is the main idea for paragraph 7 (lines 56-75).
4. Write a sentences for the main idea of paragraph 8 (lines 76-92).

g Cause and Effect

What is the cause of each of these effects?

Cause	Effect
1.	People can live their whole lives in biospheres.
2.	The whole system might breakdown.
3.	The same water must be used and reused.
4.	We will need solar system.
5.	A biosphere will be necessary to run solar energy satellites.
6.	We create more carbon dioxide.

h

Word Forms: Verbs and Nouns

Many English words are used as both a verb and a noun. Use ten of these examples in sentences, using some verbs and some nouns.

Verb

balance

kick

force

design

interview

initial

fear

crash

harm

bother

whistle

knock

Noun

balance

kick

force

design

interview

initial

fear

crash

harm

bother

whistle

knock

i

Noun Substitutes

What do these noun substitutes stand for? Sometimes the word isn't in the sentences before.

- | | | | |
|-------------|---------|---------------|-------|
| 1. Page 170 | line 3 | they | _____ |
| 2. | line 3 | we | _____ |
| 3. | line 8 | which | _____ |
| 4. | line 17 | these | _____ |
| 5. | line 20 | they | _____ |
| 6. | line 33 | it | _____ |
| 7. Page 171 | line 1 | itself | _____ |
| 8. | line 12 | he | _____ |
| 9. | line 19 | us | _____ |
| 10. | line 29 | it | _____ |

j

Noun Substitutes

Put an article in each blank if one is necessary.

1. _____ Environment Research laboratory at _____ University of Arizona is one of _____ places that design _____ biospheres.
2. _____ science fiction stories have told about _____ space colonies for years, but they were possible only in _____ author's imagination.
3. Now we are actually preparing for _____ space colonies.
4. They are _____ very complex projects.
5. There has to be _____ perfect balance among _____ plants, _____ animals (including humans), and _____ chemical elements; that is, among everything in _____ environment.
6. These would be connected to _____ main unit.
7. _____ greenhouse for growing _____ plants in winter is _____ first step toward _____ biosphere.
8. This is _____ closed environment except for _____ sun's heat entering through _____ glass or _____ plastic.

k

Guided Writing

Write one of these two short compositions.

1. Should we build biospheres? Why or why not?
2. You are living in a biosphere on Mars. Describe your life.

LESSON

2

Earthquakes



Before You Read

1. What happened in these pictures? Where are the people?
2. Have you ever been in an earthquake?
3. Can we know when an earthquake will occur?

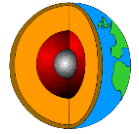
Before You Read

1. There are two ways to plant seeds. One is to put each seed in a hole in the ground. The other is to **scatter** the seeds on the ground by the handful.
 - a. spread around
 - b. push into the ground
 - c. plant by machine
2. When you take ice out of the freezer, it **melts**.
 - a. gets colder
 - b. changes to a gas
 - c. changes to water
3. At night, scientists **observe** the stars, the solar system, and other objects in the sky at an observatory.
 - a. write about
 - b. are tested on
 - c. look at
4. The prefix *pre-* means *before*. Scientists want to **predict** disasters.
 - a. stop them
 - b. protect them
 - c. tell people about them before they happen
5. A stone **sinks** in water. A piece of wood or paper floats.
 - a. goes to the bottom of the water
 - b. rides on top of the water
 - c. gets very wet

2 Earthquakes

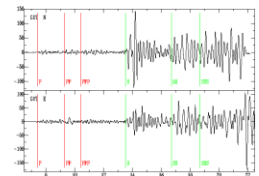
What causes earthquakes? The earth is formed of **layers**. The **surface** of the earth, about 100 kilometers thick, is made of large pieces. When they move against each other, an earthquake happens. A large movement causes a violent earthquake, but a small movement causes a **mild** one.

layers



not serious

Earthquake last only a few seconds. The rolling movements are called **seismic waves**. The seismic waves start in one place, called the **epicenter**, and **roll** outward. A seismic wave travels around the earth in about twenty minutes. Usually, an earthquake is strong enough to cause **damage** only near its epicenter.



waves

However, epicenters at the bottom of the ocean create huge sea waves as tall as 15 meters. These waves cross the ocean in several hours. Rushing toward land, they destroy small islands and ships in their path. When they hit land, they **flood** coastal areas far from the epicenter of the earthquake. In 1868, a wave reached 4.5 kilometers inland in Peru. In 1896, a wave in Japan killed 27,000 people.

too much water

After an earthquake happen, people can die from lack of food, water, and medical supplies. The amount of destruction caused by an earthquake depends on where it happens, what time it happens, and how strong it is. It also depends on types of buildings, soil conditions, and population. Of the 6000 earthquakes in the world each year, only about fifteen cause great damage and many deaths.

In 1556, an earthquake in northern China killed 830,000 people--- the most in history. There was no way to measure its strength. In 1935, scientists started using the **Richter Scale** to measure seismic waves. A seriously destructive earthquake measures 6.5 or higher on the Richter Scale.

How can scientists **predict** earthquakes? Earthquakes are not just **scattered** anywhere but happen in certain areas, places where pieces of the earth's surface meet. This **pattern** causes them to shake the same places many times. For example, earthquakes often occur on the west coasts of North and South America, around the Mediterranean Sea, and along the Pacific coast of Asia.

say it before it happens

Another way to predict earthquake is to look for changes in the earth's surface, like a sudden drop of water level in the ground. Some people say animals can predict earthquakes. Before earthquakes, people can have seen chickens sitting in trees, fish jumping out of the water, snakes leaving their holes, and other animals acting strangely.

On February 4, 1975, scientists predicted an earthquake in northeastern China and told people in the earthquake zone to leave the cities. More than a million people moved into the surrounding countryside, into safe, open field away from buildings. That afternoon, the ground rolled and shook beneath the people's feet. In seconds, 90 percent of the buildings in the city of Heicheng were destroyed. The decision to tell the people to leave the cities saved 10,000 lives.

However, more than a year later, on July 28, 1976, the scientists were not so lucky. East of Beijing, Chinese scientists were discussing a possible earthquake. During the meeting, the worst earthquake in modern times hit. Estimates of deaths **ranged** from 250,000 to 695,000. The earthquake measure 7.9 on the Richter Scale.

Earthquake often come together with volcanic eruptions. In late 1984, strong earthquakes began shaking the Nevado del Ruiz **volcano** in Colombia every day. On November 14, 1985, it **erupted**. A nearby river became a sea of mud that buried four towns. This disaster killed more than 2100 people.

volcano



San Francisco, California, also has frequent earthquakes. However, newer buildings there are built to be safe in earthquakes. Thereto, when an earthquake measuring 7.1 on the Richter Scale hit northern California on October 17, 1989, only 67 people were killed. The earthquake hit in the afternoon, when thousands of people were driving home from work. Freeways and bridges broke and fell. Buried under the layers of the Oakland Freeway, people were **crushed** in their flattened cars. Explosions sounded like thunder as older buildings seemed to **burst** apart along with the freeways. As the electric power lines broke from the falling bridges and buildings, the sky covered with huge clouds of black dust, appeared to be filled with lightning. Water rushed into the streets from broken gas lines, causing more explosions.

lightning



Emergency workers had to **cope** with medical problems. Everyone worked together to save survivors and comfort victims. The next day, the disaster sites looked terrible. Victims couldn't find their houses, their cars, or even their streets. Boats were destroyed, and debris covered the surface of the sea. There was no water, no electricity, no telephone, only the smell of garbage floating in melted ice in refrigerators open to the sun. Losses and property damage from the earthquake amounted to millions of dollars.

people who did not die

places

garbage

Seismology is the study of earthquakes, and a **seismologist** is a scientist who **observes** earthquakes. Seismologists have given us valuable knowledge about earthquakes. Their equipment measures the smallest vibration on the surface of knowledge about earthquakes to save lives and to help solve the world's energy shortage. The earth's natural activity underground creates energy in the form of heat. **Geothermal** means *earth heat*. This geothermal energy could be useful. However, if we take natural hot water out of the earth in earthquake zones, we might cause earthquakes.

important

movement

People live in earthquake zones because of natural beauty, productive soil, and large existing centers of population. However, people who live there should expect earthquake. They should be prepared to protect their lives and property. They must build safer buildings and roads. Hospitals and electric power stations must be built as far as possible from probable earthquake sites. When an earthquake starts, people must run to open ground or stay in protected areas like doorways or even bathtubs.

If seismologists could predict earthquakes, we could save about 20,000 human lives each year. Humans can control many things about nature, but we cannot control earthquake.

a Vocabulary

volcanoes	rolled	floods	valuable
waves	thunder	erupted	damage
patterns	lightning	bursts	melts
float	surface	geothermal	mild

1. Earthquakes happen in _____ around the world, sometimes several times in the same place.
2. Earthquakes can happen before the eruption of _____.
3. _____ energy comes from heat under the earth.
4. Mount St. Helens, a volcano in Washington State in the United States, _____ in 1980.
5. When Peter set his pencil on the table, it _____ off onto the floor.
6. When a tire _____ while a car is moving, it is called a blowout.
7. The weather has been _____ this week, even though it is winter. It hasn't been very cold.
8. Earthquake cause a lot of _____ to towns and roads.
9. Huge ocean _____ hit the shore during a storm, it is sometimes called an electric storm.

10. When there are _____ and _____ during a storm, it is sometimes called an electrical storm.
11. Gold and silver are _____ metals.
12. When snow _____ in the mountains, it can cause _____ in the lowlands.
13. There are both heat and activity below the _____ of the earth.

b Vocabulary

layer	scattered	floating	sites
observe	debris	ranges	seismology
victim	epicenter	property	predict

1. After the huge sank the ship, all you could see was some _____ on the surface of the sea.
2. The wind _____ my papers all over the room.
3. In a rain forest, the lower _____ of plant growth is protected by the upper layer.
4. Students who plan to become teachers usually have to _____ classes as a step toward teaching.
5. The freeway bridges fell down because it was near the _____ of the earthquake. Its weight _____ people in their cars.
6. When we are standing near a busy freeway, we can feel the _____ of the traffic under our feet.
7. The yearly pay of an engineer _____ from \$17,000 to \$75,000.
8. Before and earthquake, it is difficult to _____ how many _____ there will be.
9. Mr. Dahood used to a rich man, but he was a _____ of the earthquake and lost all his _____.
10. Sometimes when people have serious problems, they cannot _____ with them.
11. _____ has helped us find possible earthquake _____.

C Vocabulary Review

For each word in the first column, find a synonym in the second column and an antonym in the third column.

	Synonyms	Antonyms
1. Fascinating	a. common	m. uncomplicated
2. Complex	b. small	n. excited
3. So far	c. interesting	o. forbid
4. Create	d. quite	p. unusual
5. Ordinary	e. complicated	q. boring
6. Force	f. make	r. separate
7. Broad	g. make someone do something	s. not yet
8. Tiny	h. balance	t. actual
9. Connect	i. consider	u. narrow
10. Calm	j. join together	v. unit
	k. until now	w. destroy
	l. wide	x. huge

d True/False/Not Enough Information

- _____ 1. Today scientists know something about the cause of earthquake.
- _____ 2. Earthquake happens in pattern.
- _____ 3. More than half of the world's earthquakes are too small to cause serious damage.
- _____ 4. More people are killed by huge sea waves than buildings falling.
- _____ 5. Seismologists can measure the size of seismic waves.
- _____ 6. Removing water from the ground causes earthquakes.
- _____ 7. Most of the world's earthquakes are mild.
- _____ 8. An earthquake in 1989 destroyed the city of Oakland.
- _____ 9. People can predict earthquakes by studying the weather.
- _____ 10. *Thermal* means *heat*.

e Comprehension Questions

1. How does movement in the earth cause earthquakes?
2. What is the *epicenter* of an earthquake? What is a *seismic wave*?
3. Why does most of the damage from an earthquake happen near the epicenter?
4. Why are earthquakes dangerous when they happen in the middle of the ocean?
5. What do scientists who want to use geothermal energy have to remember about earthquakes?
6. What can you look for to predict an earthquake?
7. What was good about the earthquake that happened in northeastern China in 1975?
8. How can people protect themselves and their property from earthquakes?
9. Who do people continue to live where there are earthquakes?

f Paraphrasing

Use your own words to say the same thing said in these sentences from the text. It is not necessary to use the same number of sentences. You may use more.

1. Usually, an earthquake is strong enough to cause damage only near its epicenter.
2. The amount of destruction caused by an earthquake depends on when it happens, what time it happens, and how strong it is.

g Main Idea

Write or copy a sentence that is the main idea for these paragraphs.

1. Paragraph 3
2. Paragraph 8
3. Paragraph 10

h Word Forms

Verb	Noun	Adjective	Adverb
1. discuss	discussions		
2. consider	consideration	(in)considerate	(in)considerately
3.	Complexity	complex	
4. fascinate	fascination	fascinating fascinated	fascinatingly
5. create	creation creativity	(un)creative	creatively
6. value	value	valuable	
7. observe	observation observatory	(un)observant	
8. act	action activity	(in)active	actively
9. explain	explanation	(un)explainable	
10. believe	belief	(un)believable	(un)believably

1. After a long _____, the architects decided to change the design.
2. Marge is a very _____ person. She thinks of others and what they want, instead of thinking of herself most of the time.
3. The _____ of modern society affects family patterns.
4. Mark is going to study geology because he is _____ by rocks.
5. Pablo Picasso was a very _____ artist. He was known for this _____.
6. Post people want to have friends. They _____ the friendship of people they like.
7. When the director of the English program _____ classes, she writes up an _____ report.
8. Pierre has become _____ in the stamp club because he is too busy to attend. Stamp collecting used to be his favorite _____.
9. Can scientists give a clear _____ of what actually happens deep in the earth? No, some of the details are _____ so far.
10. Scientists consider it _____ that god create volcanic eruption.



Scanning

Scan the text to find this information. Write a short answer and the line number.

1. In 1975, _____ per cent of the building in the city of Haicheng were destroyed.
2. Where are some of the places where pieces of the earth's surface meet?
3. The Mexico City earthquake measured _____ on the Richter Scale.
4. What time of day did the earthquake hit northern California in October 1989?
5. What is the largest number of people killed in an earthquake?



Two-Word Verbs

Learn these two-word verbs and then fill in the blanks with the right words. Use the correct verb form. Number 2 and 3 have the same expression twice.

mix-up --- to mistake on thing for another

dress up --- put on special clothes

have on --- be careful

spread out --- spread over a certain area or time

1. Don't try to learn forty irregular verbs in one day. _____ them _____ over a week or two.
2. People usually _____ for a party. Children like to _____ in their parents' old clothes and play that they are adults.
3. She _____ her homework assignments and gave the reading homework to the wrong teacher. Then she found out she had done the wrong page. She was _____.
4. _____! There's a child in the street.
5. Mike _____ his running clothes because he was going to exercise.

k Sequencing

Put these sentences about the October 17, 1989, earthquake in the right order. Number 1 is done for you.

- _____ a. Freeways and bridges broke and fell.
- _____ b. As the electric power lines broke, the dark sky seemed to be full of lightning.
- _____ c. People were driving home in their cars in the afternoon after work.
- _____ d. Buildings exploded and pipes broke.
- _____ e. Water and gas from broken lines mixed and exploded.
- _____ f. The earth began to shake and roll.
- _____ g. People died in their cars when the freeways and bridges fell on top of them.
- _____ h. Huge clouds of black dust began to cover the sky.
- _____ i. Victims could find nothing when they came back.
- _____ j. Emergency workers hurried to find survivors and save victims.

l Summarizing

Summarize paragraph 9, lines 67-73. Use your own words to tell the main idea.

m Guided Writing

Write one of these two short compositions.

1. You are in a city when an earthquake hits. Describe what happens. Tell what you feel, see, hear, and smell.
2. You are a seismologist. Tell what scientific information you know about earthquakes. Include how and where they happen and what you are studying right now.

LESSON

n

3

Snow and Hail



Before You Read

1. What is the difference between snow and hail?
2. Are there cold storm in the winter where you live?
3. Do you like to look at snow? Do you like to be outside in it?

Context Clues

1. When a violent volcanic eruption **occurs**, there is usually damage.
a. damages b. scatters c. happens
2. We could not breathe without the earth's **atmosphere**.
a. The air around the earth.
b. The movement of the earth around the sun
c. The water on the surface of the earth
3. When Carlo is doing research, she often finds useful information in several places in the same book. She puts a **strip** of paper in each place so she can find it again easily.
a. A large white paper to take notes on
b. A long, thin piece of paper
c. A round piece of paper.
4. Wheat, corn, cotton, and fruit are valuable farm **crops**.
a. Plants people eat
b. Food that grows on low plants
c. Plants farmers grow
5. One cold January day in Montreal, dark clouds appeared in the sky the day grew colder, and millions of **snowflakes** began to of all.
a. pieces of ice b. rain c. pieces of snow
6. The earth is round. This is a fact.
a. true information b. idea c. prediction

3

Snow and Hail

Millions of people in the world have never seen snow. Others see more of it than they want to. Hail is much more common; it **occurs** even in deserts.

happens

Each tiny piece of snow is cold a **snowflake**, and each flake has six sides or six **points**. Billions of snowflakes fall every winter, and the amazing **fact** is that each one is different. A snowflake is as individual as someone's handwriting or **fingerprint**.

fingerprint



A snowflake forms inside a winter storm cloud when a **microscopic** piece of dust is **trapped** inside a tiny drop of water. This happens in the **atmosphere** 10 kilometers above the earth. The water freezes around the dust, and as this flake is blown by the wind, it collects more drops of water. These drops freeze too, and the snowflake becomes heavy enough to fall to the earth. As it falls, it passes through areas where the temperature and humidity vary. It collects more and more tiny drops of water, and the shape continually changes. Some drops fall off and start to form new snowflakes.

very small
can't escape
air around the earth

This sound simple, but it is actually very complex. It is so complex that mathematicians using computers are just beginning to understand what happens. Every change in temperature and humidity in the air around the snowflake causes a change in the speed and pattern of the snowflake's formation as it makes its trip to the earth. Since no two flakes follow exactly the same path to the ground, no two snowflakes are exactly alike. However, they are all six-sided. So far, no one understands why this is **so**.

microscope



true

Hail is a small round ball of **alternating** layer of snow and clear ice. It forms inside thunderclouds. There are two the theories about how hailstones form.

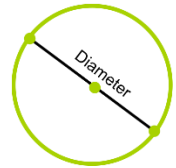
One **theory** says that hail forms when drops of water freeze in the upper air. As they fall, they collect more drops of water, just as snowflakes do. They also collect snow. The ice and snow build up in layers. If you cut a hailstone, you can see these alternating layers.

The other theory says that hail starts as a raindrop. The wind carries it higher into the atmosphere, where it gets covered by snow. It becomes heavy and begins to fall. As it falls, it gets a new layer of water, which freezes. Then the wind carries it back up to the snow region, and it gets another layer of snow. This can happen several times. Finally, the hailstone is too heavy to travel on the wind, and it falls to the ground.

Only thunderstorms can produce hail, but very few of them do. Perhaps only one in 400 thunderstorms creates hailstones.

Hail usually falls in a **strip** from 10 to 20 kilometers wide and not more than 40 kilometers long. a long, thin area

A hailstone is usually less than 8 centimeters in **diameter**. However, hailstones can be much bigger than that. Sometimes they are as big as baseballs. The largest ever **recorded** weighed over 680 grams and had a diameter of 13 centimeters.



Hail can do a lot of damage to agriculture, especially since hail usually appears in **mid**summer, when the plants are partly grown. If the **crops** are destroyed, it is too late to plant more, and the farmer has lost everything. The most damage is done by hailstones that are only the size of peas. In one terrible hailstorm in 1923 in Rostov, in Ukraine, twenty-three people and many cattle were killed. in the middle

Snow can cause damage too. It can cave in the roof of a building. A heavy snowstorm can delay airplane flights and cause automobile accidents. Farm animals sometimes die in snowstorms, and when country roads are closed by the snow, people can be trapped in their cars and freeze to death. Yet there is nothing more beautiful than the sight of millions of snowflakes falling on a still, moonlit night. That is when people think of the beauty, and not the science, of snowflakes.

a Vocabulary

fact	exactly	midsummer	traps
so	records	snowflake	microscopic
alternating	strip	points	fingerprint

1. Hail falls in a _____ about 40 kilometers long.
2. Volcanoes occur in patterns. This is a _____.
3. The weather is warm or hot in _____.
4. Trappers set _____ to catch animals.
5. Some people still believe that volcanic eruptions are caused by angry gods, but we know this isn't _____.
6. Every _____ has 6 sides or 6 _____.
7. The boys and girls lines up in _____ rows.
8. Bacteria are _____. They can't be seen without a microscope.
9. The government _____ the daily amount of rainfall.

b Vocabulary

occur	fingerprint	fact	atmosphere
theory	hail	so	crop
trap	microscope	diameter	exactly

1. No two individuals are _____ the same, not even twins.
2. When did the last eruption of Kilauea _____?
3. The police _____ criminals.
4. The distance across a circle is called the _____.
5. Humans are polluting the earth's _____.
6. Albert Einstein developed a very important _____ about relativity.
7. Cacao (chocolate) is an important _____ in West Africa.
8. _____ can destroy a farmer's crops.

C Vocabulary Review

Match the words with their definition.

- | | |
|--------------------------|-------------------------------------------------------------------------------------|
| 1. Hire _____ | a. movement of the earth |
| 2. Compare _____ | b. look for similarities |
| 3. In addition _____ | c. + |
| 4. Immigrant _____ | d. pleasant |
| 5. Earthquake _____ | e. give a job to |
| 6. Story _____ | f. CO ₂ |
| 7. Prefer _____ | g. floor |
| 8. Divide _____ | h. frame |
| 9. Respond _____ | i. of the sun |
| 10. Permit _____ | j. talk about |
| 11. Discuss _____ | k. person who goes to
another country to live
for the rest of his or her life |
| 12. Carbon dioxide _____ | l. answer |
| 13. Solar _____ | m. like better |
| 14. Create _____ | n. allow |
| | o. and |
| | p. make |

d Short Answers

Write **hail**, **snow**, or **hail and snow** after each on these sentences.

1. As it is blown by the wind, it collects water.
2. It occurs only in the colder regions of the world.
3. It is formed of layers of ice and snow.
4. It can destroy crops.
5. It can cause the death of humans.
6. It is sometimes formed around a piece of dust.
7. It always has six sides or points.
8. It is produced only by thunderstorm.
9. It is a small round ball.

10. It can cause damage.

e Comprehension Questions

1. Why do all snowflakes have six sides or six points?
2. Snowflakes start forming around two things. What are they?
3. What does a change in humidity do to the formation of a snowflake?
4. Why are no two snowflakes alike?
5. Where do hailstones form?
6. What causes both snowflakes and hail to fall to the ground?
7. About how big is the average hailstone?
8. How does hail destroy crops?
9. Give an example of how snow can be destructive.
10. Which is more destructive, hail or snow? Why?
11. Do roadrunners ever see hail?

f Main Idea

1. Write a sentence for the main idea of paragraph 2 (lines 5-10).
2. Paragraph 4 (lines 24-34).
3. Which sentence is the main idea of paragraph 11 (lines 66-74)?

g Word Forms: Negative Prefixes

These are common negative prefixes. Put a word from item no. 1 in the first sentence, and so on. Use the right form of the word.

1. **dis-** dislike, discomfort, displease, disconnect, dishonest
2. **un-** unequipped, uncreative, unprepared, unobservant
3. **non-** nonsmoking, nonalcoholic, nonviolent, nonindustrial
4. **in-** inactive, inconsiderate, incorrect, inexpensive
5. **im-** impossible, improbable, immovable, imperfect
6. **il-** illogical, illiterate
7. **ir-** irregular, irreligious
8. **mis-** misbehave, misspell, misunderstand, misspeak

1. Alice always _____ the television during a thunderstorm.
2. Bering and his men were _____ for living on the island after their boat sank.
3. Coke and Pepsi are _____ drinks.
4. It is _____ to eat something in front of someone else and not offer them some.
5. It is _____ to squeeze water out of a stone.
6. It is _____ to think that someone who is _____ is unintelligent.
7. _____ verbs must be memorized.
8. There are three _____ words in your homework paper.

h

Articles

Write an article in each blank if one is needed.

1. _____ snowflake forms inside _____ winter storm cloud when _____ microscopic piece of dust is trapped inside _____ tiny drop of _____ water.
2. This happen in _____ atmosphere 10 kilometers above _____ earth.
3. _____ water freezes around _____ dust, and as this flake is blown by _____ wind, it collects more drops of _____ water.
4. As it falls, it passes through _____ areas where _____ temperatures and _____ humidity vary.
5. It is so complex that _____ mathematicians using _____ computers are just beginning to understand what happens.
6. Every changes in _____ temperature and _____ humidity in _____ air causes _____ change in _____ speed and _____ pattern of _____ snowflake's formation as it makes its trip to _____ earth.
7. _____ hail is _____ small round ball of _____ alternating layers of _____ snow and _____ clear ice.

i

Compound Words

Make compound words using a word from the first column and one from the second.

- | | |
|------------------|-----------|
| 1. take _____ | a. by |
| 2. blow _____ | b. water |
| 3. thunder _____ | c. storm |
| 4. in _____ | d. walk |
| 5. under _____ | e. off |
| 6. under _____ | f. lands |
| 7. through _____ | g. ground |
| 8. near _____ | h. side |
| 9. side _____ | i. out |
| 10. low _____ | j. out |

j

Summarizing

Write a summary of the information about snow. Write 5 or 6 sentence.

k

Guided Writing

Write one of these two short compositions.

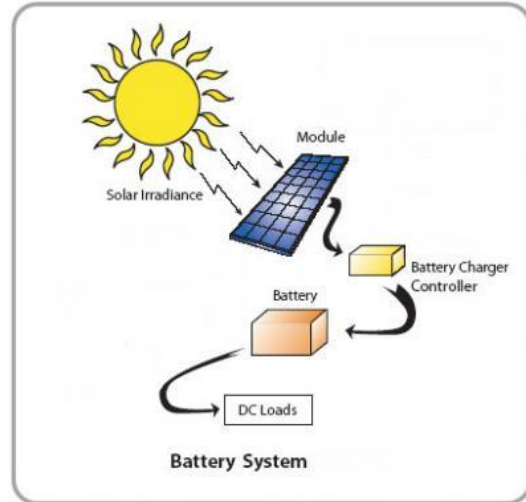
1. Compare snow and hail.
2. Describe a serious winter storm that you have experience or heard about.

LESSON

4

Photovoltaic Cells—Energy

Source of the Future



Before You Read

1. What is solar energy?
2. Do you have anything with you right now that work by solar energy? What is it?
3. How do we produce electricity? Name as many ways as you know.

Context Clues

1. The energy from the sun is inexhaustible.
a. Very tire b. can never be used up c. never gets tired
2. Glass and water are transparent. Iron and wood are not.
a. Expensive b. can float c. can be seen through
3. The Rio Grande River forms part of the boundary between Mexico and the United States.
a. Border b. patter c. highway system
4. When Masako visited England, she had to convert her Japanese money into pounds.
a. Change b. buy c. earn
5. Brazil exports coffee to Europe. Japan exports cars to China.
a. Sells to another country
b. Produces
c. Trades

4 Photovoltaic Cells

As population increase and countries industrialize, the world's **demand** for energy increases. Our supply petroleum and gas is limited, but the photovoltaic cell offers a solution to the problem of a future energy shortage. This cell is already an important **source** of energy. In fact, it seems almost like **magic**. The photovoltaic cell changes sunlight directly into energy. Solar energy, energy from the sun, is clean, easily available, **inexhaustible**, and free, if the equipment is available.

*can't be used up

Did you ever reach to open the door at a store or hotel and see it open by itself? Does your camera always let in the right amount of light for your pictures? These are examples of uses of photovoltaic cells. They are also used in calculators and watches, in remotes telecommunication units, and in central power stations to produce electricity. Another important use is in the space exploration program. This program could not exist without the energy produced by photovoltaic cells.

The photovoltaic cell is simple. It has a **transparent** metallic film at the top. Below this is a layer of silicon (Si). A metal base is at the bottom.

can be seen through

The sunlight falls on the **boundary** between the two different types of **semiconductors** in the photovoltaic cell, the silicon and the metal base. A conductor is something that electricity can pass through. Water and metals conduct electricity, but wood does not. A semiconductor conducts electricity poorly at low temperatures, but when heat or light is added, conductivity is increased.

As the light falls on this boundary between the two types of semiconductors, it creates an electric **current**. The sunlight is **converted** directly into electricity.

changed

Another advantage is that this cell is **solid-state**; that is, there are no moving parts. **Since** there are no moving parts to break down, the cell will last a long time if it is protected from damage. This protection is important. If the top of the cell even gets dusty, less light enters, and the cell doesn't work as efficiently as it should.

because

In addition, silicon is one of the commonest elements in the world; for example, sand is made up mostly of silicon. However, the chemical preparation of the silicon for use in a photovoltaic cell was very expensive at first. A maximum unit of energy cost about \$50. Now the cost has decreased to less than \$1. Then solar energy will cost the same as usual methods of energy production.

About 18 percent of the sunlight that reaches the cell is converted into electricity. This is a small amount; so many cells must be used to create a **reasonable** amount of electricity. However, technology can be developed to make the cells more efficient and raise this to 27 percent.

What does this mean to the world? Photovoltaic cells have several advantages over **fossil** fuels (gas, oil, and coal). Fossil fuels that we use today were formed from plants and animals that lived millions of years ago. Those plants and animals were able to exist because of the sun. **Obviously**, we can't wait a million years for more fossil fuels. The photovoltaic cell gives us the ability to produce energy directly from the sun. The sun's energy can be converted for our use immediately.

can be seen or
understood easily

At the present time, gas and oil are expensive. Developing countries cannot **export** enough agricultural products and other **raw materials** to allow them to **import** the fuel that they need to produce energy. At the same time, petroleum supplies are limited, and in a few decades, they will run out. However, the supply of sunlight is limitless, and most of the poor countries of the world are in the tropics where there is plenty of sunlight.

sell to other countries

The photovoltaic cell has another very important advantage. It is a clean source of energy. The fossil fuels that we use today are the main source of the pollution in our atmosphere.

It took only a decade for scientists to learn that solar energy from photovoltaic cells was not just a dream. They have already proven that it can become an important source of energy. By the end of the century, it will be cheaper to produce electricity with solar cells than from petroleum. The photovoltaic cell can be the solution to one of the most serious problems in the world today.

a Vocabulary

photovoltaic cell	inexhaustible	silicon	semiconductor
solid-state	fossil	import	exports
magic	raw material	reasonable	source

1. Scientists think that the _____ will be an important energy source for the future.
2. The number of snowflakes is limited and _____.
3. A photovoltaic cell has two different types of _____.
4. Petroleum is a _____ fuel.
5. The _____ of a river is the place it begins.
6. It is _____ that Carlos copied Maria's homework. The papers are exactly alike.
7. It is more _____ for thirty people to ride in a bus than in thirty different cars.
8. Glass is _____.
9. A hydroelectric power station _____ water power into electricity.

b Vocabulary

demanded	current	since	efficient
obvious	last	reasonable	transparent
boundary	fossil	conducts	converts

1. Electric _____ can pass through metal because metal _____ electricity.
2. The factory workers _____ higher pay for their work.
3. Much of the _____ between Canada and the United States is a straight line.
4. Abdullah missed the test _____ he was late for class.
5. Thirty minutes is a length of time for a short test.
6. It is _____ that Carlos copied Maria's homework. The papers are exactly alike.
7. It is more _____ for thirty people to ride in a bus than in thirty different cars.

8. Glass is _____.
9. A hydroelectric power station _____ water power into electricity.

C Vocabulary Review

Underline the word that does not belong with the others.

1. Hail, snowflakes, trap, rain
2. Create, damage, destroy, harm
3. Definite, sure, exact, bacteria
4. Satellite, planet, star, sun
5. Consider, object, discuss, talk over
6. Backward, forward, clockwise, sideward
7. Physicist, anthropologist, chemist, geologist
8. Burst, eruption, flood, earthquake
9. Fly, bee, ant, snake

d Multiple Choice

1. Solar energy will not be _____ in the future.
a. expensive b. easily available c. limitless
2. Sunlight first enters a photovoltaic cell through _____.
a. a metal base b. a metallic film c. a layer of silicon
3. The place where the two semiconductors meet is called the _____.
a. border b. conductor c. boundary
4. A semiconductor works best _____.
a. when there is wood available
b. when the temperature is low
c. when light or heat is added.
5. A photovoltaic cell _____ light into electricity.
a. current b. converts c. conductors
6. The cell must be protected from _____.
a. dust b. light c. movement
7. At first, these cells were expensive to make because _____.
a. The chemical preparation of silicon was expensive
b. Silicon is expensive and hard to find.
c. It is hard to keep dirt off the cells

8. Most of today's air pollution comes from _____.
a. Automobiles
b. Burning fossil fuels
c. Factories

e Comprehension Questions

1. Why do we need a new way to produce energy?
2. Describe a photovoltaic cell.
3. Give three advantages of photovoltaic cells over fossil fuels.
4. In what part of the cell is the electric current created?
5. What does *solid-state* mean?
6. What happens when a photovoltaic cell gets dusty?
7. Why was energy from photovoltaic cells expensive in the beginning?
8. How can these cells help Third world countries?
9. Why are photovoltaic cells so important in the space program?

f Main Idea

1. Which sentence is the main idea of paragraph 1 (lines 1-11)?
2. What is the main idea of paragraph 9 (lines 65-75)?
3. Write a sentence for the main idea of paragraph 2 (lines 12-22).
4. Write the main idea of paragraph 6 (lines 40-46).

g Scanning

1. Name a material in the reading that does not conduct electricity.
2. Name a material in the reading that is made mostly of silicon.
3. About how much did a unit of solar energy cost at first? About how much does it cost now?
4. Name three fossil fuels.

h Two-Word Verbs

get in	-	arrive, for example, a bus or plane
bring up	-	raise children
show up	-	appear
stand by	-	wait for a seat on an airplane without a ticket
leave out	-	skip, forget to include something

1. When Ali did his homework, he _____ the third exercise. He forgot to do it.
2. What time does the train from Paris _____.

3. The airline said these were no seats available on this flight, but if someone doesn't _____, I can have that seat. I have to _____ until everyone has boarded. Sometimes standby seats are cheaper, but you take the chance of not getting on the flight.
4. Mary was born on a farm, but she was _____ in a small town.



Missing Words

Fill in the blanks with any word that fits in the sentence.

1. _____ population increases and countries industrialize, _____ world's demand _____ energy increases.
2. This cell _____ become _____ important source _____ energy.
3. _____ you ever reach _____ open door _____ a store _____ hotel _____ see it open _____ itself?
4. This program could _____ exist _____ the energy produced _____ photovoltaic cells.
5. It has _____ transparent metallic film _____ to the top. _____ this is _____ layer of silicon(SI).
6. The sunlight falls _____ the boundary _____ two different types _____ semiconductors, _____ silicon _____ the metal base.
7. This cell _____ solid-state; _____ is, _____ are no moving parts.
8. Since there _____ no moving parts to break _____, the cell _____ last _____ long time _____ it is protected _____ damage.
9. If _____ top of _____ cell even _____ dusty, less _____ enters, _____ the cell _____ work as efficiently _____ it should.



Word Forms

This is common use of an adjective. There are two sentences pattern.

It is + adjective_____.

It is necessary to memorize irregular verbs.

It is beautiful to walk by the ocean on a moonlit night.

It is important that you fill out these papers immediately.

It is wonderful that you won first place in the competition.

Verb	Noun	Adjective	Adverb
1. trap	trap	trapped	trapper
2. alternate	alternate alternative	alternate alternative	alternately alternatively
3. occur	occurrence		
4. bound	boundary	bound	
5. theorize	theory	theoretical	theoretically
6.	efficiency	(in)efficient	(in)efficiently
7.	reasonableness	(un)reasonable	reasonably
8. exhaust	exhaustion	exhausted	(in)exhaustible
9.	transparency	transparent	transparently
10. convert	conversion		

1. When an animal is _____, it can't get a way.
- 2a. There is no _____ to our plan. We can find no _____ plan.
- 2b. The government can give poor people free food, or, _____, it can give them money to buy food.
3. There were three _____ of breakdown in the electric power station.
- 4a. Norway is _____ by Sweden, Finland, Russia, the Atlantic Ocean, and the North Sea.
- 5a. Scientists _____ about the center of the earth, but they can't know for sure.
- 5b. _____, there are black holes in space.

6. It is _____ to write by hand instead of using a computer.
7. It is _____ to expect a student to memorize fifty new words a day.
8. Scott and his men became _____ on their journey back from the South Pole.
9. _____ is a characteristic of water and glass.
10. Missionaries try to _____ people to their religion.

k Finding The Reason

Write the reason for each statement.

Statement	Reason
1. The entrance door at a hotel opens by itself	
2. Electricity can pass through water.	
3. The first photovoltaic cells were very expensive	
4. These cells can help the Third World.	
5. Energy from the sun is inexhaustible.	
6. The photovoltaic cell can't break down	
7. The photovoltaic cell might work inefficiently.	

l Guided Writing

Write one of these two short compositions.

1. What are some of the advantages of solar energy over energy made from fossil fuels?
2. What are some of the disadvantages of solar energy?

LESSON

5

Biological Clocks



Before You Read

1. Do all birds live in the same place all year round?
2. What part of the day do you prefer? Do you feel best early in the morning, in the middle of the day, in the afternoon, at sunset, or late at night?
3. If you take a long trip on an airplane, do you feel uncomfortable when the time zone changes?

Context Clues

Circle the letter of the best meaning of the bold word.

1. France, England, the United States, Japan, South Africa, and Australia are examples of countries in the two temperature zones.
 - a. The hot, humid tropics.
 - b. Near the North or South pole
 - c. Between the tropics and the Arctic or Antarctic Circle
2. At **dawn**, the sky begins to get light and the sun appears.
 - a. sunrise
 - b. sunset
 - c. a storm with thunder and lightning
3. Millions of monarch butterflies migrate every fall from North America to southern Mexico and Central America. In spring, they return north.
 - a. travel a long distance because of the season
 - b. travel a long distance to lay eggs
 - c. return to their home
4. Every night Mohammed sets his alarm clock. In the morning, it wakes him up.
 - a. a clock that makes a noise at a certain hour
 - b. a clock that tells the day, month, and year
 - c. a clock that is in the bedroom
5. The private school organized several events for Parents' Day. There were races for the small children, a soccer game, a musical program, a picnic, and meetings with the teachers.
 - a. any kind of game or sport
 - b. anything that happens
 - c. programs for children

5

Biological Clocks

If you have ever flown across several time zones, you have experienced **jet lag**. You arrived in a new time zone, but your body still living on the time in the old zone. You were wide awake and ready in the middle of the night, and you wanted to sleep all day.

People suffer from jet lag because all living things have a biological clock. Plants and animals are all in rhythm with the natural divisions of time—day and night and the seasons.

At sunrise, plants open their leaves and begin producing food. At night, they rest. In the **temperate** zones of the earth, trees lose their leaves in fall as the days grow shorter and there is less sunlight. In the spring, leaves and flowers begin growing again as the days lengthen.

Rain sets the rhythm of desert plants. Plants in the desert may appear dead for months or even years, but when it begins to rain the plants seem to come to life overnight. The leaves turn green, and flowers appear. The plants produce seeds quickly, before the rain stops. These seeds may lie on the ground for years before the rain starts the cycle of growth again. The plants' biological clock gave the **signal** for these things to happen.

At **dawn** most birds wake up and start singing. When the sun goes down, they go to sleep. When spring arrives, they start looking for a mate. When winter comes, some birds **migrate** to a region with a warmer climate. Their biological clocks tell them it is time to do all these things.

sunrise

Animals that live near the sea and depend on both the land and water for their food have their biological clocks set with the **tides**. When the tide goes out, they know it is time to search for the food that the sea left behind it.

Some insects seem to set their **alarm** clocks to wake them up at night. They are out all night looking for food and then sleep during the day. Honeybees have a very strong sense of time. They can tell by the **position** of the sun exactly when their favorite flowers open.

Some French scientists did and **experiment** with honeybees. They put out sugar water every morning at 10:00 and at noon, and the bees came to drink the water at exactly the right time. Then the scientists put the sugar water in a room that was brightly lit twenty-four hours a day. They started putting the sugar water out at 8:00 p.m. It took the bees a week to find it at the different hour, but from then on, they come to eat in the evening instead of in the morning.

Later the scientists took the honeybees to New York. The bees came for the food at the time their bodies told them, only it was 3:00 p.m. New York time. Their bodies were still on Paris time.

Humans, like other animals, have a biological clock that tells us when to sleep and eat. It causes other changes too. Blood **pressure** is lower at night, the **heartbeat** is slower, and the body temperature is a little lower. We even go through several levels of sleep, cycles of deep and light sleep.

Other events occur in cycles too. More babies are born between midnight and dawn than at any other time. More natural deaths occur at night, but more heart **attacks** happen early in the morning. Most deaths from disease in hospitals occur between midnight and 6:00 a.m. some police say there are more violent crimes and traffic accidents when there is a full moon.

anything that
happens

The honeybees in the experiment reset their biological clock for different feeding hours. Human do this too. People who work at night learn to sleep during the day and eat at midnight. Students who fly halfway across the world to study in another country get used to the new time zone after a few days. When they go home, they change back again. Our bodies are controlled by a biological clock, but we can learn to reset it at a different time.

How to Lessen Jet Lag

make less,
decrease

1. Try not to become exhausted before you leave. Get plenty of sleep, and leave enough time to get to the airport and check in without having to hurry.
2. Wear **loose** clothing, and take your shoes off while you are in your seat.
3. Walk around the plane and move around in your seat.
4. Figure out breakfast time in the time zone you are flying to. Four days before your flight, start a **feast** (eating a lot) and **fast** (eating nothing or very little) schedule. On the fourth day before you fly, eat three heavy meals. If you drink coffee, tea, or cola drinks that contain **caffeine**, have them only between 3:00 and 5:00 p.m. On the third day before your flight, eat very lightly---salads, lights soups, fruits, and juices. Again, have drinks with caffeine only between 3:00 and 5:00 p.m. On the next to the last day before you leave, fast. If you are flying west, drink caffeinated drinks in the morning; if you are going east; drink them between 6:00 and 11:00 p.m.
5. On the day you leave, have your first meal at the time people in the new time zone eat breakfast. If it is along flight, sleep on the plane until the new breakfast time, and don't drink alcohol. When you wake up, have a big meal. Stay awake and active, and eat at the new time zone hours

loose ≠ tight

a Vocabulary

signal	position	pressure	attack
alarm	experiments	event	jet lag
temperature	migrate	heartbeat	fast

1. Countries with _____ climate have four different seasons.
2. A photovoltaic cell has to be in the right _____ for the sunlight to enter.
3. A wedding is an important _____ in anyone's life.
4. Students usually have to do _____ in chemistry class.
5. Some people _____ for religious reasons.
6. When the fire _____ sounded, everyone left the building.
7. Doctors listen to a person's _____ through stethoscope to see if there are any irregularities.
8. High blood _____ can cause a serious illness.
9. Pilots don't usually suffer from _____ because they never stay in the new time zone very long.

b Vocabulary

rhythm	dawn	temperate	tides
feast	lessen	migrate	signal
pressure	caffeine	loose	experience

1. Chocolate, tea, coffee, and cola drinks contain _____.
2. The police officer gave a _____ for the cars to stop.
3. Some birds _____ to a warmer climate in the winter.
4. The villagers prepared a _____ to entertain the visiting government officials.
5. There are high and low _____ in the ocean twice a day.
6. The sun rises at _____.
7. _____ is the opposite of *tight*.
8. A different diet _____ the effect of jet lag.

C Vocabulary Review

stroke	stood for	tools	senses
units	projects	rolls	waves
guess	valuable	mild	surface

1. U.S.S.R. _____ the Union of Soviet Socialist Republics.
2. A carpenter cannot work without _____.
3. Water, light, and sound travel in _____.
4. You can often use the context to _____ what a word means.
5. Dust on the _____ of a photovoltaic cell makes it work inefficiently.
6. Hearing is one of the five _____.
7. A ball or other round object _____.
8. This textbook has _____.
9. Biospheres are special _____ at many environment research laboratories.
10. Diamonds are _____.

d True/False/Not Enough Information

1. *Jet lag* means your body is in one time zone but your biological clock is in another.
2. Plants begin producing nutrients when the sun rises.
3. Plants in Iceland and Greenland can produce nutrients twenty-four hours a day during the summer.
4. A biological clock gives birds the signal that it is time to migrate.
5. Animals that live near the sea search for food at night when it is safer.
6. The honeybees in the experiment reset their biological clocks.
7. After a few days, the bees probably changed their biological clocks to New York time.
8. The human biological clock affects many parts of the body.
9. Humans cannot change their biological clocks once they are set, but bees can.
10. You can decrease the effects of jet lag.

e Comprehension Questions

1. What makes desert plants produce seeds?
2. Why do birds wake at dawn?
3. How do honeybees know when a flower opens?
4. Who do they want to know when a flower opens?
5. What is the time difference between New York and Paris?
6. Why should you wear loose clothing on a long flight?
7. Why should you have breakfast at breakfast time in the new time zone on the day you leave?

g Word Forms: Adjectives

Both the **-ing** form of the verb (the present participle) and the **-ed** form (the past participle) are used as adjectives. The **-ed** form often shows that the noun received the action, or it describes how a person feels. The **-ing** form often shows the action that the noun took, or it describes an object or possibly a person. However, there are many exceptions.

David was **bored** because the movie was **boring**.

Tome is **interested** in stamps. He thinks stamps are **interesting**.

Maria is an **interesting** person because she can talk about a lot of different things.

Put the right form of each participle in each sentence.

1. (exhaust) Climbing a mountain is _____ work.
2. (exhaust) Al was _____ after the soccer game.
3. (demand) Mr. Davis is a very _____ teacher. He makes the students work hard and do their best.
4. (alternate) There are two kinds of electric current, direct and _____.
5. (trap) The _____ animal couldn't escape.
6. (damage) A _____ car needs to be fixed.
7. (guess) Children like to play _____ games.
8. (fascinate) Monopoly is a _____ game for some people.
9. (complicate) American football is a _____ game.
10. (terrify) Being in an airplane crash is a _____ experience.

h

Word Forms: Semi- and Hemi

Hemi- is a prefix that means **half**. Hemisphere is the most common word with this prefix.

Semi- is a prefix that means **half** or **partly**. These are some common words with this prefix:

semiconductor
semicolon(;)
semitransparent
semisolid (toothpaste and ice cream are semisolid.)
semifinal (in sports competitions)
semifinalist
semitropical (Hawaii is semitropical, but it is not in the tropics.)
semiweekly (twice a week; some meetings are held semiweekly and some magazines are published semiweekly)
semimonthly (twice a month)
semiyearly(twice a year)
semiprivate(a hospital room with two or three patients)
semisweet (some chocolate is semisweet)

Use 6 of these words in interesting sentences.

i

Prepositions

1. If you have ever flown _____ several time zones, you have experienced jet lag.
2. You arrived _____ a new time zone, but your body was still living _____ the old zone.
3. You were wide awake and ready _____ dinner _____ the middle _____ the night.
4. Plants and animals are all _____ rhythm _____ the natural divisions _____ time.
5. _____ the temperate zones _____ the earth, trees lose their leaves _____ fall as the days grow shorter.

6. Plants _____ the desert may appear dead _____ months or even years.
7. Some animals depend _____ the sea for their food.
8. Some insects wake _____ night.
9. Honeybees can tell _____ the position _____ the sun exactly when their favorite flowers open.
10. They put _____ sugar water every morning _____ 10:00 and noon.



Connecting Words

Connect a sentence from the first column with one from the second column using **since, when, until, or even though**.

- | | |
|-------------------------------------------------|-----------------------------|
| 1. The bees were ready to eat New York. | a. It was only 3:00 p.m. in |
| 2. It has been snowing. | b. It kept her awake. |
| 3. Chris stopped drinking coffee in the evening | c. It becomes dusty. |
| 4. Birds start singing. | d. The sun went down. |
| 5. A photovoltaic cell is efficient. | e. The sun rises. |



Sequence

Put these sentences about the French experiment in the right order.

- a. The scientists took the bees to New York.
- b. Some French scientists did an experiment.
- c. They put the sugar water out at 8:00 p.m.
- d. They put the sugar water out at 10:00 a.m. and noon.
- e. The bees looked for food at 3:00 p.m. New York time.
- f. F. the bees took a week to find the food at a different time.
- g. The bees came every evening at 8:00 p.m.



Guided Writing

Write one of these two short compositions.

1. What does “biological clock” mean? Give examples.
2. Describe a time when you experienced jet lag.

Video Highlights

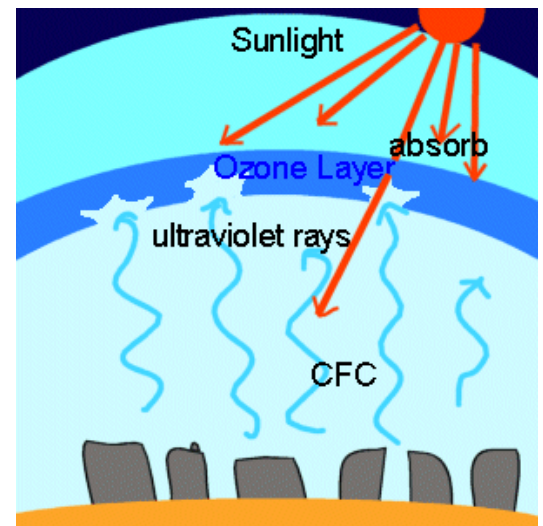
a Before You Watch

1. Use your own knowledge and the world map at the end of this book to discuss these questions.
 - a. Which hemisphere of the earth do you live in, northern or southern?
 - b. Is it safe or dangerous to spend a lot of time in direct sunlight? Why?
 - c. What are some of the things people use that cause damage to the Earth's atmosphere?



2. The paragraph below describes a chemical process that takes place in the Earth's atmosphere. Use the diagram to fill in the missing words.

The ozone layer is part of the atmosphere that surrounds the Earth. It is made up of ozone (O_3) molecules, which form a protective shield against the _____ rays of the sun. Some of the things people use every day are causing serious damage to the ozone layer. For example, chemicals used for air conditioning and refrigerators release harmful chlorine (Cl) molecules react with the _____ molecules to break it down. This process gradually eats up the ozone layer.



b**As You Watch**

According to the scientists in the video, which of the following is the main cause of damage of the ozone layer?

- _____ flight over the Northern Hemisphere
- _____ ultraviolet rays from the sun
- _____ widespread use of manmade chemicals

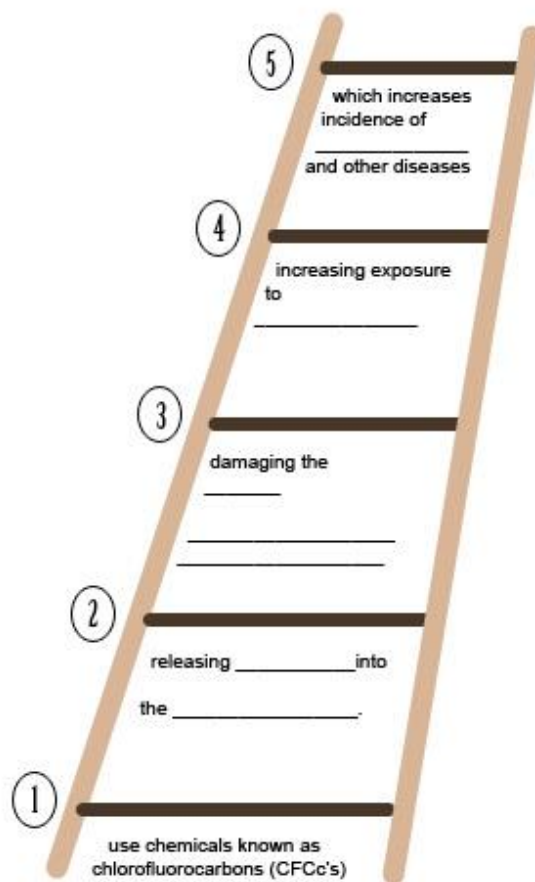
c**After You Watch**

1. Start from the bottom of this “ladder”. Each cause leads to an effect, which in turn causes another effect. Fill in the missing word.

Using the cause and effect ladder you completed, explain to a partner how using certain chemicals can cause harm to all living things.

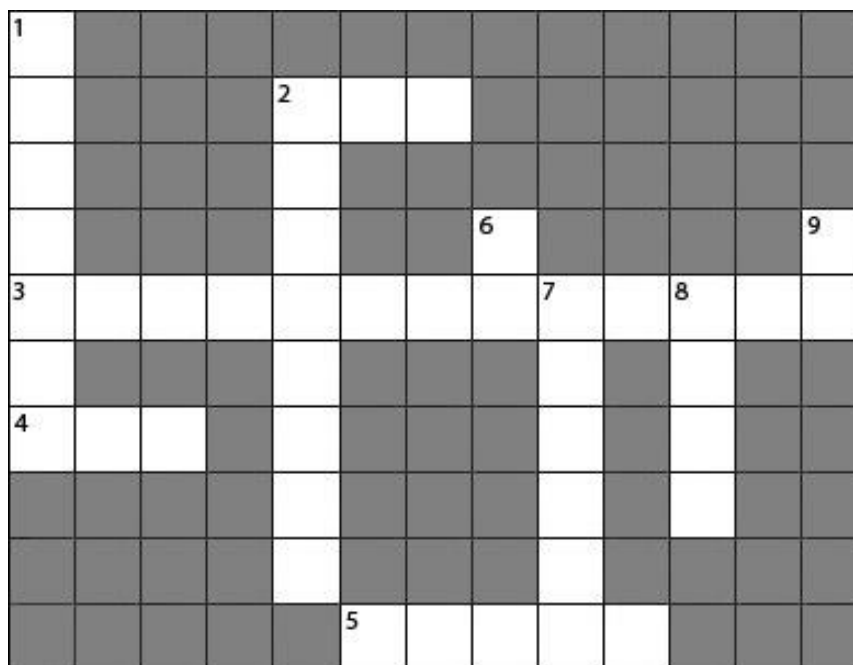
Example:

“When you use chemicals known as CFC’s, they release. . .”



Activity Page

Chemical Crossword



Across

2. Common abbreviation for chlorofluorocarbon.
3. Too much of this gas can cause destruction of the rain forest (two words).
4. Silicon is an example of a ____ - metallic element
5. This gas forms a layer that helps protect the life the Earth from the sun

Down

1. This element is used in photovoltaic cells
2. This gas causes damage to the ozone layer
6. Chemical symbol for #1 down.
7. Necessary for all animal
8. A very strong metal used to make frames for skyscrapers.
9. Chemical symbol for # 8 down.

Dictionary Page

Doing Dictionary Research

1. Look up the word *geothermal* in your dictionary. How many other words do you see that begin with *geo-*?

2. This dictionary page has seven words beginning with *geo-*. Read their definitions and answer the following questions.
 - a. How are the meaning of the words *geography*, *geology*, *geometric*, *geophysics*, and *geopolitics* alike?
 - b. What do you think the prefix *geo* means?
3. Look up the word *psychology*, *microscopic*, and *semiconductor* in your dictionary. Look for other word nearby that have related meanings. Then complete the chart

ge-og-ra-phy / *n.* 1. the scientific study of the earth's surface, climate, people, etc.: *I brought a new atlas for my geography class.* 2. The way parts of a place are positioned within it, (syn.) layout: *I can't meet you inside the mall because I don't know the geography of the place, and I might get lost.* —*adj.* geographic.

ge-ol-o-gy/ *n.* the scientific study of the earth through its rocks, soil, etc.: *In geology we studied the rocks and deserts of California.* *n.* **geologist**; —*adj.* **geologic**.

ge-o-met-ric / *adj.* with regular shapes and lines. *The mosque's walls are decorated with geometric design.*

ge-om-e-try / *n.* the study in mathematics of lines, angles, shapes, etc.: *It is important to study geometry if you want to be an architect.*

ge-o-phys-ics / *n.pl. used with a sing. v.* the study that uses physics to examine the movements and activities of the earth.

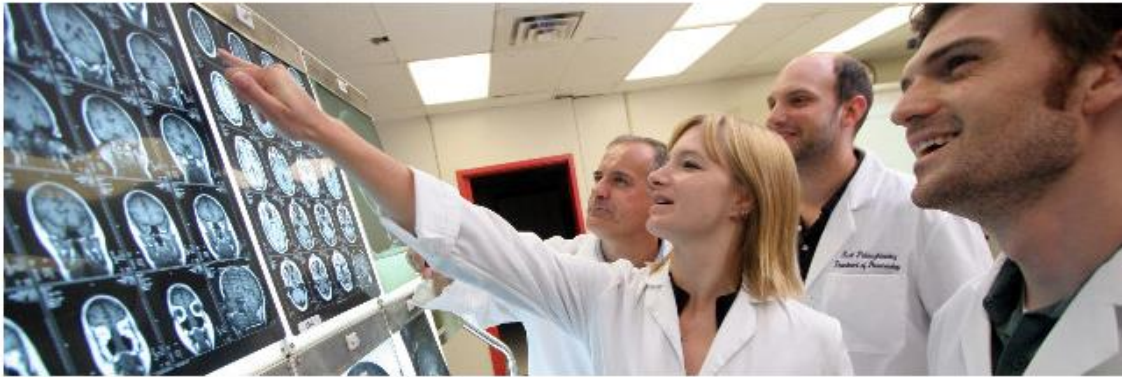
ge-o-pol-i-tics / *n. used with a sing.v.* the study of how geography affects the politics.

ge-o-ther-mal / *adj.* related to heat found deep inside the earth. *The geysers in Yellowstone National Park are geothermal because of hot water coming from inside the earth. See : geyser.*

word	related word	prefix	meaning
<i>psychology</i>	<i>psychopath</i> <i>psychic</i>	<i>psych-</i>	<i>related to the mind</i>
<i>microscopic</i>			
<i>semiconductor</i>			

Medicine and Health

unit 5

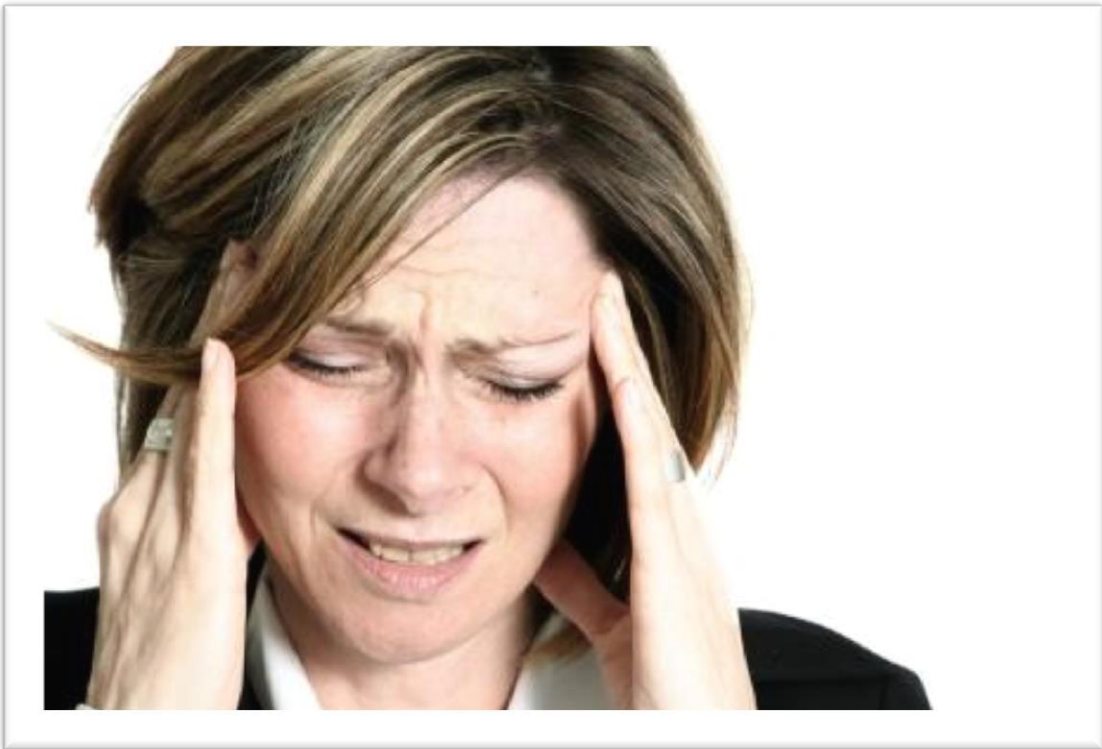


Early to bed and early to rise makes a man healthy, wealthy, and wise.

LESSON

1

Headaches



Before You Read

1. How often do you have headaches?
2. What causes you to have a headache?
3. How do you treat your headaches?

Context Clues

1. After Isamu got hit in the nose with a baseball, his nose started to **swell**.
a. get bigger b. smell c. alarm
2. Old Mr. Rossi's **vision** is getting bad, so he wears strong glasses.
a. health b. ability to see c. blood pressure
3. Doctors do not know how to **cure** some diseases.
a. make better b. do research on c. protect
4. Maria's hair hangs down into her eyes. She keeps pushing it back off her **forehead**.
a. the top part of the face
b. the top of the head
c. the part of the face under the eyes
5. There are five **patients** waiting to see the doctor.
a. people who are very calm
b. people who have a medical problem
c. people who are studying medicine

1

Headaches

Some little man is inside your head, **pounding** your brain with a **hammer**. Beside him, a knock musician is playing a drum. Your head feels as if it is going to explode. You have a headache, and you think it will never go away.

hammer



Doctors say there are several kinds of headaches. Each kind begins in a different place and needs a different treatment.

One kind starts in the **arteries** in the head. The arteries **swell** and send **pain** signals to the brain. Some of these headaches start with a change **vision**. The person sees wavy lines. This is a **warning** that a headache is coming. The headache occurs on only one side of the head. The vision is **blurred**, and the person may **vomit** from the pain. These headaches, which are called **migraine** headaches, are more frequent in women than in men. Sleep is the best cure for them.

get larger

ability to see; sight

Cluster headaches, which also start in the arteries, are called cluster headaches because they come in clusters of groups for 2 to 3 months. Then there are no more for several months or even years. A cluster headache lasts up to 2 hours and then goes away. At the beginning of the headache, the eyes are red and watery. There is a **steady** pain in the head. When the pain finally goes away, the head is **sore**. Men have more cluster headaches than women do.

continuing

painful

The **muscle** headache, which starts in the muscles in the neck or **forehead**, is caused by **tension**. A person works too hard, is **nervous** about something, or has problems at work, at school, or at home. The neck and head muscles become tense, and the headache starts. A muscle headache usually starts in the morning and gets worse as the hours pass. There is a steady pain, pressure, and a bursting feeling. Usually **aspirin** doesn't help a muscle headache very much.

forehead



How do doctors treat headaches? If a person has frequent headaches, the doctor first has to decide what kind they are. Medicine can help, but there are other ways to treat them.

The doctor asks the patient to analyze his or her daily living patterns. A change in diet or an increase in exercise might stop the headaches. If the patient realizes that difficulties at home, at work, or at school are causing the tension, it might be possible to make changes and decrease these problems. Psychological problems and even medicine for another **physical** problem can cause headaches. of the body The doctor has to discuss and analyze all these patterns of the **patient's** life. A headache can also be a signal of a more serious problem.

Everyone has headaches from time to time. In the United States alone, up to 50 million persons each year go to the doctor because of headaches. If you have a headache, and it continues over several days, or keeps **recurring**, it is time to talk to occurring again a doctor. There is no magic cure for headaches, but doctors can control most of them because of recent research.

a Vocabulary

pounded	swells	blur	migraine
cluster	sore	forehead	aspirin
recur	drums	pain	hammer
artery	nervous	vomit	cures

1. _____ means to *happen again*.
2. If your arm is _____, it hurts. You have a _____ in your arm.
3. The _____ is the top part of the face.
4. _____ help some kinds of headaches.
5. When we went to our friend's apartment, we knocked and the _____ on the door, but no one answered.
6. One kind of headache is called a _____.

7. A _____ is one kind of tool.
8. When you put air in a bicycle tire, the tire _____ until it fits the wheel exactly.
9. After the TOEFL test, the students gathered in small _____ to talk about it.
10. Do you feel _____ when you have to take a test?

b Vocabulary

ache	warned	blurred	arteries
vomit	cures	physical	swell
steady	patients	muscles	tense
vision	hammer	drum	forehead

1. When you are sick and in pain, your stomach may protest and make you _____.
2. The teacher _____ the children that they had to behave or there would be no party.
3. People in the hospital are called _____.
4. While Pat was swimming, she got water in her eye. Everything looked _____.
5. Students feel _____ before an important exam.
6. Tension in the _____ of the neck can cause a headache.
7. The farmers were happy when a _____ rain continued all night.
8. _____ carry blood from the heart to the rest of the body.
9. Today there are _____ for many diseases that used to kill people.
10. People with poor _____ wear glasses or contact lenses.
11. You may get a stomach _____ if you eat too much.
12. A complete _____ examination is necessary for anyone entering the army.

C Vocabulary Review: Antonyms

Match the opposites.

- | | | |
|------------|-------|---------------|
| 1. Fiction | _____ | a. point |
| 2. Scatter | _____ | b. import |
| 3. Active | _____ | c. nonfiction |
| 4. Fact | _____ | d. unclear |
| 5. Obvious | _____ | e. microscope |
| 6. Last | _____ | f. run out |
| 7. Export | _____ | g. gather |
| 8. Loose | _____ | h. increase |
| 9. Fast | _____ | i. inactive |
| 10. Lessen | _____ | j. theory |
| | | k. feast |
| | | l. tight |

d Multiply Choice

- When someone sees black dots or wavy lines, this is a change in _____.
a. blurring b. clusters c. vision
- A migraine headache causes _____.
a. Blurred vision
b. Red and watery eyes
c. A bursting feeling
- _____ is the best cure for migraines.
a. sleep b. aspirin c. arteries
- _____ have more headaches that leave the head sore.
a. women b. men c. older people
- A _____ headache start in the morning and gets worse.
a. migraine b. cluster c. muscle
- Tension causes a _____ headache.
a. migraine b. cluster c. muscle
- The _____ headache is the most common.
a. migraine b. cluster c. muscle

8. Medicine is _____ headaches.
 - a. The best treatment for
 - b. Not usually helpful for
 - c. One way to treat
9. A change in a patient's life patterns cans _____.
 - a. Help cure headaches b. cause headaches c. both a and b

e Comprehension Questions

1. Describe a migraine headache.
2. Describe a cluster headache.
3. Describe a muscle headache.
4. Which kind of headache affects more women than men?
5. What are some things that can cause a muscle headache?
6. If you have a headache, will aspirin help?
7. Who does a doctor analyze the life patterns of a headache patient?
8. How many people each year in the United States go to a doctor for headaches?

f Main Idea

Write the main idea of these paragraphs.

1. Paragraph 2
2. Paragraph 3
3. Paragraph 7

g Word Forms

Verb	Noun	Adjective	Adverb
1. press	pressure		
2. experiment	experiment	experimental	experimentally
3. migrate	migration		
4. lessen	least	less	
5. warn	warning		

6. pain	pain	painful	painfully
		painless	painlessly
7. swell	swelling	swollen	
8. recur	recurrence		
9. tense	tension	tense	tensely
10. prove	proof	proven	

1. Mr. Johnson has high blood _____. He has to take medicine every day.
2. Physics teachers do _____ in class.
3. Scientist study the _____ of birds.
4. The pain of some headaches is _____ by aspirin.
- 5a. A fire alarm is _____ to leave the building.
- 5b. A _____ light tells people there is danger.
6. A broken arm is _____.
7. Dan hurt his hand and now it is _____.
8. After the fifth _____ of a bad headache, Mark went to a doctor.
9. _____ causes muscles headaches.
10. Scientists have _____ that photovoltaic cells convert sunlight directly into energy. This was _____ some year ago.

h Scanning

Scan the text to put these sentences in the right column. Write both the letter of the sentences below and the number of the line in the text where you find the idea.

	Migraine	Cluster	Muscle
a. They come in groups.			
b. It starts in the neck of forehead.			
c. It is caused by tension.			
d. There is a change in vision.			
e. There may not be any for several years.			
f. Aspirin doesn't help.			
g. Sleep helps.			
h. It occurs on only one side of the head.			
i. It lasts for 2 hours or less.			

- j. Problems at work can cause it.



Noun Substitutes

What do these words stand for?

- | | | | |
|----------|---------|---------------|-------|
| 1. Pages | line 2 | him | _____ |
| 2. | line 3 | it | _____ |
| 3. | line 9 | this | _____ |
| 4. | line 14 | them | _____ |
| 5. | line 15 | which | _____ |
| 6. | line 23 | which | _____ |
| 7. Pages | line 4 | his | _____ |
| | | or her | _____ |
| 8. | line 18 | them | _____ |



Articles

1. Beside him, _____ rock musician is playing _____ drum.
2. Each kind begins in _____ different place and needs _____ different treatment.
3. One kind starts in _____ arteries in _____ head.
4. _____ arteries swell and send _____ pain signals to _____ head.
5. Some of these headaches start with a change in _____ vision.
6. _____ person sees _____ wavy lines, _____ block dots, or bright spots in front of _____ eyes.
7. This is a warning that _____ headache is coming.
8. _____ headache occurs on only one side of _____ head.
9. _____ vision is blurred and _____ person may vomit from _____ pain.
10. _____ sleep is _____ best cure for them.

k Verb + Adjective

These verbs are usually followed by an adjective: **be, feel, become, seem, act, appear, look, smell, taste.**

She is sick.

He appears tired.

She feels sick.

He looks tired.

She became sick a week ago.

It smells good.

He seems tired.

It tastes good.

He acts tired.

Use each verb in an interesting sentence.

l Guided Writing

Write one of these two short compositions.

1. Describe the different kinds of headaches.
2. Discuss ways to treat and cure headaches.

LESSON

2

Sleep and Dreams



Before You Read

1. What is the girl dreaming about?
2. Think about your dreams. How often do you dream? Do you dream in color or in black and white? What language do you dream in?
3. Do you think dreams come true?

Context Clues

1. Saudi Arabia has a **great deal** of petroleum.
a. some b. a lot of c. too much
2. **At times** you can feel a rock musician pounding a drum in your head.
a. sometimes b. at a certain hour c. always
3. Tom always confuses Nissan cars with Hondas.
a. signals b. mixes up c. introduces
4. Billy is 5 years old. Sometimes he wakes up in the middle of the night and cries. He has **nightmares**.
a. bad dreams b. drums c. alarm clocks
5. Love, hate, and anger are **intense** feelings.
a. strong b. opposite c. mild
6. Children from ages thirteen to nineteen are **adolescents**.
a. young b. teenagers c. grownups
7. Mary has a bad **habit** of playing with her hair all the time.
a. something that bothers her
b. more activity
c. something she does often

2

Sleep and Dreams

Sometimes dreams are terrifying, but they are usually a collection of scattered, **confused** thoughts. If you dream about something that is worrying you, you may wake up exhausted, **sweating**, and with a rapid heartbeat. Dreams have **positive** effects on our lives. During a dream, the brain may **concentrate** on a problem and look for different solutions. Also, people who dream during a good night's sleep are more likely to remember newly learned skills. In other words, you learn better if you dream.

mixed up

with water on the skin

opposite of negative

to think hard

Researchers say that **normal** people may have four or five REM periods of dreaming at night. The first one may begin only a half hour after falling asleep. Each **period** of dreaming is a little longer, the last lasting up to an hour. Dreams also become more **intense** as the night continues. **Nightmares** usually occur toward dawn.

lengths of time

very strong

bad dreams

People dream in color, but many don't remember the colors. Certain people can control some of their dreams. They make sure they have a happy ending. Some people get relief from bad dreams by writing them down and then changing the negative stories or thoughts into positive ones on the written paper. Then they study the paper before they go to sleep again.

Many people talk in their sleep, but it is usually just confused half sentences. They might feel embarrassed when someone tells them they were talking in their sleep, but they probably didn't tell any secrets.

Sleepwalking is more common among children. They usually grow out of it by the time they become **adolescents**. Children don't remember that they were walking in their sleep, and they don't usually wake up if the parent leads them back to bed.

teenagers

Some people have the habit of grinding their teeth while they sleep. They wake up with a sore jaw or a headache, and they can also damage their teeth. Researchers don't know why people talk, walk or grind their teeth while they are asleep.

There are lots of jokes about snoring, but it isn't really funny. People **snore** because they have trouble breathing while they are asleep. Some snorers have a condition called sleep **apnea**. They stop breathing up to thirty or forty times an hour because the throat muscles relax too much and **block** the airway. Then they breathe in some air and start snoring. This is dangerous condition because, if the brain is without oxygen for 4 minutes, there will be **permanent** brain damage. Sleep apnea can also cause irregular heartbeats, a general lack of energy, and high blood pressure.

always, forever

Most people need from 7½ to 8½ hours of sleep at night, but this varies with individuals. Babies sleep eighteen hours, and old people need less sleep than younger people. If someone continually sleeps longer than normal for no **apparent** reasons, there may be something physically or psychologically wrong.

obvious, adjective for
appear

You cannot save hours of sleep the way you save money in the bank. If you have only 5 hours of sleep for three nights, you don't need to sleep an extra 9 hours on the weekend. And it doesn't do any good to sleep extra hours ahead of time when you know you will have to stay up late.

What should you do if you have trouble sleeping? Lots of people take sleeping pills, but these are dangerous because they habit-forming. If you take them for several weeks, it is hard to stop taking them.

Doctors say the best thing is to try to relax and to avoid bad habits. If you always go to bed and get up at about the same time, this sets a good and healthy rhythm in your life. Caffeine keeps people awake, so don't drink caffeine drinks in the evening. Smoking and alcohol can also keep you awake. You may have trouble sleeping if you have a heavy meal just before you go to bed. Eat earlier in the evening.

You may also have trouble sleeping if you have a problem or something else on your mind. This is when you need to relax. As you lie in bed, tense the muscles in your feet and then relax them. Continue up the body, tensing and relaxing the muscles until you reach the head. Start with the feet again if you are still tense. Then remember some pleasant experience you had and relieve it. If you are thinking about a problem or about something exciting that is going to happen the next day, get up and write about it. That will help take it off your mind. You can also get up and read or watch television. Be sure to choose a book or show that is not too exciting, or you may get so interested that you won't want to go to sleep even when you feel sleepy.

Sleep is important to humans. We spend a third of our lives sleeping, so we need to understand everything we can about sleep.

Sleep well! Sweet dreams!

a Vocabulary

stage	periods	normal	habit
oxygen	embarrassed	confused	positive
a great deal	at times	sweat	concentrate
nightmare	grinds	snore	block

1. It is hard to _____ on your homework if your roommate is playing loud music.
2. It is not _____ to have a headache for a week.; you should go to a doctor.
3. In the first _____ of a volcanic eruption, the volcano sends out smoke.
4. A _____ is a bad dream.
5. _____, a headache begins without warning.
6. The school day is divided into several _____, one for each class.
7. Marcel _____ coffee with a coffee grinder.

8. Sylvia has a _____ of having a cup of coffee as soon as she gets home from work.
9. Hard exercise makes you _____.
10. A Mercedes-Benz car costs _____ of money.
11. Do you _____ when you sleep?
12. There is no reason to feel _____ when you make a mistake in class.

b

Vocabulary

confused	positive	intense	adolescents
jaws	apnea	apparently	sweat
habit	block	permanently	breathe

1. Fish can _____ underwater; people cannot.
2. The _____ summer heat of the Arabian Desert can be very dangerous if you're not careful.
3. *Negative* is the opposite of _____.
4. David was _____ about the date, so he missed the meeting.
5. Someone with sleep _____ stops breathing many times during the night.
6. An immigrant plans to stay in a new country _____.
7. The professor seems to be very busy. _____, he has a lot of works to do.
8. _____ are not children, but they are grown up either.
9. The teeth are in the upper and lower _____.
10. A car accident can _____ a highway.

C Vocabulary Review

Match the words with the definitions.

- | | | |
|------------------|-------|-------------------------------|
| 1. Melt | _____ | a. middle |
| 2. Mid- | _____ | b. distance across a circle |
| 3. Strips | _____ | c. fingerprint |
| 4. Crops | _____ | d. reasonable |
| 5. Diameter | _____ | e. no moving parts |
| 6. Inexhaustible | _____ | f. change solid to a liquid |
| 7. Solid-state | _____ | g. can be seen through |
| 8. Source | _____ | h. because |
| 9. Transparent | _____ | i. long, thin piece |
| 10. Boundary | _____ | j. place |
| 11. Since | _____ | k. happening |
| 12. Position | _____ | l. can't be used up |
| 13. Event | _____ | m. place something comes from |
| | | n. border |
| | | o. any plants a farmer grows |

d True/False/Not Enough Information

1. We spend about a third of our lives sleeping.
2. Researchers now understand nearly everything about sleep.
3. NREM sleep comes before the REM stage.
4. After the three stages of NREM, REM lasts the rest of the night.
5. Dreams occur during the REM stage, but the brain is normally blank the rest of the time.
6. A dream about an unhappy event can change your heartbeat.
7. Nightmares occur early when dreams are short.
8. People dream in color.
9. Sleep apnea is the cause of some snoring.
10. It is a good idea to sleep a few extra hours of the weekend if you know you have a lot of work to do the next week.
11. Five or 6 hours of sleep are enough for some people.

12. The best thing to do when you have trouble sleeping is to take sleeping pills.

e Comprehension Questions

1. How have researchers learned about sleep?
2. What does REM mean?
3. At what stage of sleep do people move around?
4. How do dreams change as the sleep period continues?
5. Why do people feel embarrassed if they talk in their sleep?
6. Can sleeping be dangerous? Give a reason for your answer.
7. Why do some people grind their teeth while they sleep?
8. How can sleep apnea cause brain damage?
9. Name three things that can keep you awake.
10. How does a problem keep you from sleeping?

f Main Idea

Find or write a sentence for the main idea of these paragraphs.

1. Paragraph 3
2. Paragraph 5
3. Paragraph 7
4. Paragraph 13

g Scanning

Write short answers and the line number for these questions.

1. In what stage of NREM can a sudden noise wake you up?
2. Why do people snore?
3. Why is it a bad idea to take sleeping pills?
4. How many REM periods of dreaming do normal people have?
5. What did some people use to believe about dreams?
6. What should you do if you can't sleep because you are thinking about an exciting event the next day?
7. Is it possible to control dreams?
8. Can you save up on sleep ahead of time?
9. How many times a night does an average person move?
10. How many hours days do babies sleep?

h

Connecting Words

Connect a sentence from the first column with one in the second using these words: **before, after although, and since.**

- | | |
|--------------------------------------------------|------------------------------------------------------|
| 1. People move in their sleep. | A. You go to bed. |
| 2. Scientists don't know everything about sleep. | B. It isn't really funny. |
| 3. We shouldn't laugh about snoring. | C. The REM stage begins. |
| 4. Don't eat a heavy meal. | D. This sets a rhythm in your life. |
| 5. Go to bed and get up at about the same time. | E. They have learned a lot in the last thirty years. |
| 6. The REM stage begins. | F. The NREM stage begins |

i

Missing Words

Write any word is correct for the blanks.

1. Sleeps is very important _____ humans; _____ average person spends 220,000 hours of _____ lifetime sleeping.
2. Then doctors _____ scientists began doing research _____ sleep laboratories.
3. They have learned _____ great deal _____ studying people as they slept.
4. Scientists study _____ body characteristics that change _____ sleep.
5. NREM _____ divided _____ three stages.
6. You reach stage three _____ less _____ thirty minutes.
7. Sleep is _____ biological need, _____ your brain never rally sleeps.
8. _____ things that were _____ your mind during _____ day are still there _____ night.
9. _____ times people believed _____ dreams had magical powers _____ that they could tell _____ future.
10. _____ is possible _____ dreams have _____ positive effect _____ our lives.

j

Word Forms

Verb	Noun	Adjective	Adverb
1.	(ab) normality normalcy	(ab)normal	(ab)normally
2.	habit	habitual	habitually
3. concentrate	concentration		
4. confuse	confusion	confused	
5.	intensity	intense	intensely
6.	adolescence	adolescent	
7. breathe	breath breathing	breathless	breathlessly
8.	permanence	permanent	permanently
9. loosen	looseness	loose	loosely
10.(dis) appear	(dis)appearance	apparent	apparently

1a. _____, classes begin at 8:00, but there is a special meeting today.

1b. Sleep apnea is an _____.

2. The present tense is used for _____ actions.

3a. Great _____ is necessary for the game of chess.

3b. Most of Australia's population is _____ on the east coast.

4. There was a lot of _____ about the new class schedule, but now it is all cleared up and things are going smoothly. At first, the students were _____.

5. Susan feels everything very _____.

6. _____ is a difficult time for young Americans and their parents.

7. Tom spoke _____ because he was so excited.

8. Nora married a German and is going to live _____ in Germany.

9. Carol _____ her belt because it was too tight.

10. The plane got in an hour ago, but Mohammed hasn't called _____ he wasn't on it.

k Guided Writing

Write one of these two short compositions. Paraphrase the information as much as possible.

1. When and why do we dream?
2. If a person trouble sleeping, what can he or she do about it?

LESSON

3

Health Care and Epidemics



Before You Read

1. When you are sick, do you take medicine? Why? How can people prevent disease?
2. Have you ever been in a place that was having an epidemic? What did the people do about it?

Context Clues

1. When you are sick, you feel **miserable**.
a. very bad b. very reasonable c. very steady
2. Today there are **remedies** for diseases that people used to die from.
a. medicines b. cures c. aspirin
3. The teacher was busy, so Katsuko **volunteered** to help the new student with her schedule.
a. Did it without being asked
b. Waited for the teacher to choose someone
c. Avoided
4. What is the **worth** of learning Japanese if you are never going to Japan?
a. Occurrence b. value c. pain
5. Mr. Thomas sat reading the paper. **Meanwhile**, his 2 children were doing their homework.
a. Unpleasant b. although c. at the same time

3

Health Care and Epidemics

Everyone suffer from disease at some time or another. However, millions of people around the world do not have good health care. Sometimes they have no money to pay for medical treatment. Sometimes they have money, but there is no doctor. Sometimes the doctor does not know how to treat the disease, and sometimes there is no treatment. Some people are afraid of doctors. When these conditions are present in large population centers, **epidemics** can start.

Epidemics can change history. Explorations and wars cause different groups of people to come into **contact** with each other. They carry strange diseases to each other. For example, when the Europeans first came to North and South America, they brought diseases with them that killed about 95 percent of the Native American population. touch

People are very afraid of unknown things, especially diseases. People have all kinds of ideas about how to prevent and treat diseases. Some people think that if you eat lots of onions or garlic, you won't get sick. Others say you should take huge amounts of vitamins. Scientific experiments have not proved most of these theories.

However, people still spend millions of dollars on vitamins and other probably useless treatments or preventatives. Some people want **antibiotics** whenever they get sick. Some antibiotics are very expensive. Much of this money is wasted because some diseases are caused by a virus. Viruses are even smaller than bacteria, and they cause different kinds of diseases. Antibiotics are useless against viruses.

Because of their fear, people can be **cruel** to victims of disease. Sometimes they fire them their jobs, throw them out of their apartments, and refuse them transportation services. In the **plague** epidemics a few hundred years ago, people simply covered the doors and windows of the victims' houses and left them to die inside, all in an effort to protect themselves from getting sick.

a very serious
disease carried by
insects

Doctors know how most epidemic diseases spread. Some, like **tuberculosis**, are spread when people **sneeze** and **cough**. The explosive cough and sneeze sends the bacteria shooting out into the air. Then they enter the mouth or nose of anyone nearby.

Others are spread through human contact, such as on the hands. When you are sick and blow your nose, you get viruses or bacteria on your hands. Then you touch another person's hand, and when that person touches his or her mouth, nose or eyes, the disease enters the body. Some diseases spread when people touch the same dishes, towels, and furniture. You can even pick up disease when you touch things in public buildings.

Other diseases are spread through insects, such as flies, **mosquitoes**, and **ticks**.



mosquitos



ticks

One disease that causes frequent, worldwide epidemics is **influenza**, or flu for short. The **symptoms** of influenza include headache and sometimes a runny nose. Some victims get sick to their stomachs. These **symptoms** are similar to symptoms to other, milder diseases. Influenza can be as much more serious disease, especially for **pregnant** women, people over sixty-five, and people already suffering from another disease such as heart problems. About half of all flu patients have a high body temperature, called a **fever**. Flu is very **contagious**. One person catches the flu from another person; it doesn't begin inside the body as heart disease does.



pregnant

goes easily from
a sick person to a
healthy person

Sometimes medicine can **relieve** the symptoms. That is, it can make a person cough less, make headaches less intense, and stop noses from running for a while. However, medicine can't always cure the disease. So far, there is no cure for many diseases and no medicine to prevent them. People have to try to prevent them in other ways.

make better

Some diseases can be prevented by **vaccination**. A liquid vaccine is **injected** into the arm or taken by mouth and the person is safe from catching such disease. Other diseases can be prevented by good health habits, such as drinking only clean water, boiling water that might carry disease, and washing the hands often.



Epidemics usually start in areas of large population. Poor people in big cities who live crowded together in **miserable** conditions have the most health problems. They often have the least education about disease prevention. If they know what to do, they often do not have the money to do it. For example, it is difficult for a person who has no electricity to refrigerate food or boil drinking water. With no money, the persons can't even buy soap to wash his or her hands.

very bad, inferior

Disease prevention costs much less than disease treatment. It seems completely illogical, but some countries like the United States spend much more health-care money on treatment for disease than on programs to prevent disease in the first place. Most doctors and other hospital workers stay in their **institutions**. Only a few doctors go out into the streets of the poor areas to educate the people. Only a few doctors and some nurses vaccinate people and supervise them to make sure they take their medicine. Most people who help the poor people with their health problems are **volunteers**.

How can you use all this information for your own good health? When someone you know becomes ill, try to avoid physical contact with that person. If you get sick yourself, keep your towel and dishes separate from everyone else's. Try not to touch things that belong to others. Don't touch other people, and don't shake hands. Explain why, however; you don't want people to think you are impolite. Wash your hands often if you are ill or if anyone around you is ill.

Researchers continue searching for a way to cure or prevent epidemic diseases. **Meanwhile**, it is **worth** the money for governments to provide preventive health care for all of their people. Preventing epidemics is much cheaper than stopping them after they have started and thousands of people are ill.

a Vocabulary

cough	epidemics	cruel	institutions
meanwhile	contagious	sneeze	miserable
plague	antibiotics	vaccination	influenza

1. _____ is called the flu.
2. Some diseases are spread when people _____ and _____.
3. When you have a headache, you probably feel _____.
4. Babies should receive _____ to prevent common childhood diseases. Then they won't catch these _____ diseases.
5. Governments should provide health care. _____, they should give money for new research into the causes of disease.
6. _____ kill thousands, even millions, of people worldwide.
7. Hospitals and universities are example of _____.
8. It is very _____ to put a sick person out of his or her house into the street to live.
9. The _____ epidemics killed half the population of Europe before _____ were discovered.

b Vocabulary

fever	contact	tuberculosis	symptoms
relieve	volunteer	viruses	injected
pregnant	worth	mosquitoes	ticks

1. When your temperature above normal, you have a _____.
2. There is no physical _____ in tennis. The players don't touch each other while they play.
3. Ms. Davis is _____. She is going to have a baby in May.
4. How much is gold _____ today?
5. Diseases caused by _____ cannot be cured with antibiotics.
6. Some vaccines are _____ into the arm; others are taken by mouth.

7. Aspirin can _____ some headaches.
8. What are the _____ of a cold? How do you know you have one?
9. Thousands of people _____ to work for the Red Cross without pay.
10. Diseases carried by _____ and _____ enter the victim's blood through the bites of these insects.
11. _____ enters the body when the victim breathes the air coughed out by a sick person.

C Vocabulary Review

raw materials	attacked	dawn	tide
hammer	drummer	record	pounded
swell	arteries	forehead	recurring

1. Blood is carried from the heart through the _____.
2. If you hit your thumb with a _____, the thumb will probably _____ up.
3. Sometimes the sky is beautiful at _____.
4. Tom got hit in the _____ with the ball.
5. The army _____ at dawn to surprise the enemy.
6. Rita has a _____ pain in the stomach. It comes and goes.
7. The waves move higher up on the beach as the _____ comes in.
8. Iron and cotton are _____.
9. Dan _____ on the table to get everyone's attention.
10. Every rock music band has a _____.
11. The government keeps a _____ of a birth of every child.

d Multiple Choice

1. Coughing is a _____ of tuberculosis.
 - a. Miserable
 - b. epidemic
 - c. symptoms

2. Medicine _____ a disease.
 - a. Can cure
 - b. Can relieve the symptoms of
 - c. Can prevent
3. Without the Europeans, North and South America _____.
 - a. Would probably have more Native Americans
 - b. Would probably have no diseases
 - c. Would probably have no wars
4. Which one of these sentences is not true?
 - a. Antibiotics can be expensive.
 - b. Antibiotics have saved the lives of many sick people.
 - c. Antibiotics will help cure viruses.
5. _____ prevent some diseases.
 - a. There is no vaccine to
 - b. You can have a vaccine injected into your arm to
 - c. Both a and b
6. Tuberculosis spreads _____.
 - a. By hand contact
 - b. When people cough and sneeze
 - c. When people don't eat garlic.
7. The best way to avoid epidemics is to _____.
 - a. Lock sick people up inside their houses
 - b. Take lots of vitamins
 - c. Provide health care for people crowded in cities.

e Comprehension Questions

1. Name the symptoms of influenza.
2. What does medicine do for diseases?
3. Is it worth the expense to take extra vitamins?
4. How do epidemics spread?
5. How can epidemic change history?
6. Do you think you should or should not shake hands with someone who is ill? Why?
7. Why do poor people have the most health problems?

8. Why do people who live in the city have more health problems than people who live in the country (outside of cities)?
9. How can humans prevent diseases from becoming epidemics?



Main Idea

What is the main idea of the paragraphs?

1. Paragraph 2 (lines 12-19)
2. Paragraph 4 (lines 36-44)
3. Paragraph 6 (lines 50-58)
4. Paragraph 10 (lines 82-88).



Cause and Effect

Write the effect for each of these causes.

Cause

Effect

1. A virus enters the body.
2. People take medicine.
3. A person with tuberculosis coughs.
4. A vaccine is injected into the body.
5. A student drinks from a sick roommate's glass.



Word Forms

Verb

Noun

Adjective

Adverb

- | | | | |
|--------------|----------------|----------------|-----------------|
| 1. | (im)politeness | (im)polite | (im)politely |
| 2. | cruelty | cruel | cruelly |
| 3. relieve | relief | | |
| 4. volunteer | volunteer | (in)voluntary | (in)voluntarily |
| 5. inject | injection | | |
| 6. | pregnancy | pregnant | |
| 7. | contagion | contagious | contagiously |
| 8. lengthen | length | long | |
| 9. reason | reason | (un)reasonable | (un)reasonably |

1. The idea of _____ is different from one country to another.

- 2a. The government was known for its _____ to prisoners.
- 2b. It is _____ to hit a very old or sick person.
3. Mary felt _____ when she found out her daughter has arrived safely at her grandparents' home.
4. Mark did not go into the army _____. He went because it is the law that all young men must serve in the army.
5. Children don't like to have _____.
6. A human _____ lasts 9 months.
7. Heart trouble is not _____.
8. In the spring, the days start to _____.
9. Mehdi was very angry. We tried to _____ with him, but he was completely _____ and wouldn't listen at all.



Two-Word Verbs

Learn these two-word verbs and then fill in the blanks with the right words. Use the correct verb form.

grow out of -- a child stops doing or feeling something as she or he grows older.

get out of -- avoid doing

show up -- appear or arrive

put off -- delay

read up on -- get facts and information on a subject by reading

1. Hiroko always tries to _____ talking in front of the class because she doesn't like to do it.
2. Tom had planned to go to the shopping center today, but he _____ it _____ until the weekend because he's so busy.
3. Children _____ sleepwalking when they become adolescent.
4. Marge is going to _____ photovoltaic cells because she wants to know more about them.
5. Bob didn't _____ for the party until almost midnight.

j

Articles

Write an article in each blank if one is needed.

1. However, millions of _____ people around _____ world do not have _____ good health care.
2. Sometimes _____ doctor does not know how to treat _____ disease, and sometimes there is no treatment.
3. _____ people have all kinds of _____ ideas about how to prevent and treat _____ diseases.
4. _____ explosive cough or sneeze sends _____ bacteria shooting out into _____ air.
5. Then they enter _____ mouth or nose of _____ anyone nearby.
6. Some diseases spread when _____ people touch _____ same _____ dishes, _____ towels, and _____ furniture.
7. Some countries like _____ United States spend much more health-care money on _____ treatment for diseases than on program to prevent _____ disease in _____ first place.

k

Summarizing

Summarize paragraph 3, lines 20-35. Use your own words to tell the main idea in no more than 3 or 4 sentences.

l

Guided Writing

Write one of these two short compositions.

1. You are a health-care worker who is going into a poor area of a big city. You have seen several cases of tuberculosis and influenza this month. You are going to try to prevent an epidemic among the people in this area. What will you say to the people?
2. A government official in your country has asked you for your suggestions about improving health care. What will you say to the official?

LESSON

4

CPR



Before You Read

1. What is happening in the picture?
2. Do you think the woman is a doctor, or could she be a person without medical training?
3. Do you know how to do CPR? If not, would you like to learn?

Context Clues

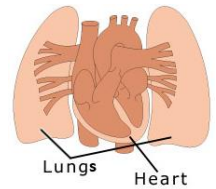
1. Adults should never **strike** children, even when the children misbehave.
a. Hit b. help c. block
2. Alice couldn't swim very well, but she swam way out into the middle of a lake. She was too tired to swim back to shore, and her head kept going under the water. Finally she **drowned**.
a. Rested b. died in the water c. concentrated
3. How do you think your parents will **react** when you tell them you are going to marry someone from another country?
a. Act in response to a situation.
b. Start doing some activity
c. Act again
4. Paul has a new car and **so do I**.
a. I am too. b. I do too. c. I think it is true.
5. A photovoltaic cell cannot **function** efficiently if it has dust on it.
a. breathe b. confuse c. work
6. Take this umbrella with you **in case** you need it.
a. if maybe b. such as c. at times

4 CPR

CPR stands for cardiopulmonary **resuscitation**. *Cardio* is a medical word for *heart*. *Pulmonary* is a medical word for **lungs**. *Resuscitate* means to *bring back to life*. CPR starts someone's lungs and heart **functioning** again after they have stopped.

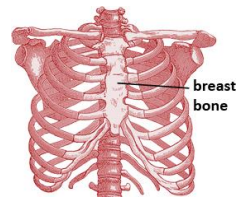
working

It is an amazing that there is a cure for sudden death. It is equally amazing that this magic is not done by today's high technology. Any ordinary person can do it. You use your own lungs to breathe into the patient's mouth and start his or her lungs working. You push on the heart with your hands to make it start beating again. It is as easy as that.



The heart is a large muscle that **pumps** blood through the arteries. It is **located** in the center of the **chest** behind the **breastbone**. The lungs are at either side of the heart. Air enters the nose and mouth and moves through the airways to the lungs, bringing oxygen into the body. As the blood moves through the lungs, it picks up the oxygen and carries it to the cells throughout the body. At the same time that the blood picks up the oxygen, it leaves carbon dioxide as a waste material, and the lungs breathe it out through the airway.

found



When the heart stops beating, or a person stops breathing, this whole process stops. No oxygen is taken into the body, and the blood doesn't move through the arteries. CPR can start the process moving again.

There are several situations when CPR is needed. It can used when a person has a heart attack and the heart stops. A heart attack occurs when the heart cannot get enough oxygen. This usually happen because one of the two arteries to the heart has become narrow or completely blocked. The heart muscle cells that are supplied with oxygen by that artery die because they stop receiving oxygen.

One of the symptoms of a heart attack is a feeling of pressure and tightness or aching in the center of the chest. It lasts longer than 2 minutes, and it may come and go. The person having a heart attack may also start sweating, feel weak, be short of breath, and feel like vomiting. However, there may be no symptoms at all; the heart may stop breathing. If CPR is started immediately, it may bring the person back to life.

CPR can also be used when a person receives an electric **shock**. If enough electricity enters the body, the person dies immediately. CPR can resuscitate the person. An electric shock usually happens to someone who has been working carelessly with electricity. It can also happen if lightning **strikes** a person.

hits

A third situation is **drowning**, or dying in water, which happens most often in the summer when many people go swimming. Children can also drown when they are left alone near a swimming pool. A person trained in CPR can help a person start to breathe after clearing the water out of the airway.

These are the three most common cause of sudden death when CPR can be used. There are the other less common. Someone in a burning building may breathe in too much smoke and not get any oxygen into the lungs. Some people have an intense **reaction** to certain drugs or to the **sting** of a bee or some other insect, and the heart and lungs stop functioning.

CPR is an example of first aid. An ordinary person can take a **first aid** class and learn what to do until the patient receives professional help. This might mean helping someone until an **ambulance** comes. Then professionals can use their equipment to **take charge** of the patient. Or it might mean giving first aid and then taking the patient to a doctor. CPR can keep a person alive until he or she reaches a hospital.

help

ambulance



When you give CPR, you breathe directly into the patient's mouth. Then you press on the heart in the center of the chest. You continue alternating these two actions.

CPR is easy to learn, but you shouldn't learn it from a book. You should receive instruction in a class where you can practice in front of the instructor until you do it correctly. As you know, if the brain is without oxygen for 4 minutes, there will be permanently brain damage. It is necessary to start CPR immediately when a person stops breathing, or as soon as possible. You have to know how to do it quickly and well.

If someone in your family has heart trouble, if you go swimming a lot, or if you plan to work with electricity, you should learn CPR. In fact, everyone should learn, **in case** they ever need it.

Where can you learn it? The Red Cross has CPR classes, any hospitals teach it, and so do some university student health centers. If there are no classes where you live, ask the Red Cross or a nearby hospital to organize a class.

CPR is worth learning. It can give you the chance to save someone's life.

a Vocabulary

resuscitation	located	pump	strike
sting	first aid	react	lung
breastbone	process	drown	function

1. The heart is directly behind the _____.
2. Village people often have to _____ water by hand.
3. Volcanoes are _____ in clusters.
4. Hail and snow are formed by a similar _____.
5. A bee _____ is painful.
6. The _____ of the heart is to pump blood through the arteries.
7. Children should wear a life preserver when they are around water so they can't _____.
8. Anyone can learn to give _____. You don't have to be a doctor or nurse.
9. The *R* in CPR stands for _____.

b**Vocabulary**

chest	so	in case	shock
lungs	breastbone	process	ambulance
take charge	strike	reaction	drown

1. The _____ are in the chest and _____ is the heart.
2. In baseball, if player tries to hit the ball and misses it, it is called a _____ even though he didn't hit the ball.
3. An electric _____ can kill a person.
4. An _____ is used to take patients to a hospital.
5. A strong _____ to a drug can kill a person.
6. Edward volunteered to _____ of arranging food for the party.
7. The natural _____ that makes garbage disappear is slowed at landfills because the garbage gets no air or water.
8. You cannot save up sleep ahead of time _____ you need it later.

C**Vocabulary Review: Synonyms**

Match the words that mean the same.

- | | | |
|-----------------|-------|--------------|
| 1. worth | _____ | a. a lot |
| 2. miserable | _____ | b. blur |
| 3. contagious | _____ | c. teenager |
| 4. a great deal | _____ | d. catching |
| 5. at times | _____ | e. vision |
| 6. nightmare | _____ | f. forever |
| 7. confused | _____ | g. value |
| 8. adolescent | _____ | h. location |
| 9. permanently | _____ | i. painful |
| 10. sore | _____ | j. unhappy |
| 11. dawn | _____ | k. sometimes |
| 12. position | _____ | l. sunrise |
| | | m. mixed up |
| | | n. bad dream |

d True/False/No Information

1. *Resuscitation* is a medical word.
2. Sudden death can be cured only by using today's technology.
3. The arteries take carbon dioxide out of the lungs.
4. Carbon dioxide enters the lungs through the airways.
5. CPR can be used in cases of drowning.
6. CPR can help a person with a sleep apnea.
7. A common situation when CPR is needed is with a reaction to an insect sting.
8. First aid is an example of CPR.
9. Everyone should get a book about CPR and learn how to do it.
10. You should call an ambulance before you start CPR.

e Comprehension Questions

1. What is the function of the lungs?
2. What are the symptoms of a heart attack?
3. What are the three most common situations when CPR is needed.
4. What is first aid?
5. How can CPR prevent brain damage?
6. What professionals work with patients?

f Main Idea

What is the main idea of these paragraphs?

1. Paragraph 2 (lines 7-14).
2. Paragraph 11 (lines 82-85).
3. Paragraph 13 (lines 95-98).



Prepositions and Two-Word Verbs

1. Some children are afraid of the dark, but they grow _____ it.
2. CPR stands _____ cardiopulmonary resuscitation.
3. CPR is a method _____ starting someone's lungs and heart again _____ they have stopped.
4. It is amazing idea that there is a cure _____ sudden death.
5. You should take a class _____ CPR. Don't put it _____.
6. No oxygen is taken _____ the body, and the blood doesn't move _____ the arteries.
7. One _____ the symptoms _____ a heart attack is a feeling _____.
8. CPR may bring the person back _____ life.
9. Then professionals can take charge _____ the patient.
10. Some people have an intense reaction _____ the sting _____ a bee.



Compound Words and Two-Word Verbs

Make a compound word by joining a word from the first column with one from the second column. More than one answer is correct for several of the words. Some of these are also written separately as two-word verbs.

- | | | |
|----------|----------|-------|
| 1. break | a. in | _____ |
| 2. stand | b. down | _____ |
| 3. work | c. work | _____ |
| 4. check | d. mate | _____ |
| 5. sun | e. rise | _____ |
| 6. home | f. night | _____ |
| 7. sleep | g. by | _____ |
| 8. out | h. grow | _____ |
| 9. life | i. walk | _____ |
| 10. over | j. way | _____ |
| 11. air | k. time | _____ |
| 12. room | l. out | _____ |



Word Forms

Verb	Noun	Adjective	Adverb
1. resuscitate	resuscitation		
2. locate	location		
3. react	reaction		
4. drown	drowning		
5.	similarity	(dis)similar	(dis)similarly
6. relate	relation(ship)	relative	relatively
	relatively	(un)related	
7. medicate	medicine	medical	medically
8. die	death	dead	
9. light	lightning	light	
lighten			
10. tighten	tightness	tight	tightly

1. With CPR, you may be able to _____ someone.
- 2a. The newspaper gave the time and _____ of the university entrance exam.
- 2b. The Chemistry Building is _____ next to the Physics Building.
- 3a. How would you _____ if you saw someone's is drowning?
- 3b. There are machines to test your _____ time when you are driving.
4. There were two cases of _____ at the beach near our home last year.
5. What is the _____ between snow and hail?
- 6a. What is the _____ between changes in the family and population growth?
- 6b. Population growth in industrial countries is _____.
- 6c. Munir is _____ to the Minister of Education.
7. Jane wants to go to _____ college and become a doctor.
8. A heart attack doesn't always cause _____.
9. Before it started to rain, there was a lot of thunder and _____.
10. The little boy held _____ to his father's hand.

j

Summarizing

Write a summary of the text for this lesson. Write only important information using 3 to 5 sentences.

k

Guided Writing

Write one of these two short compositions.

1. What happens during CPR and how does it work?
2. What are some situations in which CPR is useful?

LESSON

5

Cholesterol and Heart Disease



Before You Read

1. Do you have a healthy diet? Why do you think so?
2. What effect can exercise have on heart disease?
3. Is it difficult or easy to change your lifestyle? Why?

Context Clues

Circle the letter of the best meaning of the **bold** word.

1. A student with a short purple hair walked into the classroom. Everyone **stared** at him.
a. talked b. swelled c. looked intensely
2. I like your new shirt. It's very **attractive**.
a. pretty b. large c. permanent
3. That young man looks **familiar**. I think he attended my high school.
a. like a member of a family
b. like someone I know
c. like a relative of mine
4. Paulo was **confident** that he could save someone's life after he took a CPR class.
a. sure b. process c. volunteer
5. I ate a big dinner, but I felt a little hungry. Before I go to bed, I think I'll have a **snack**.
a. big meal b. pizza c. small amount of food
6. Sharon said her new car was worth \$30,000, but it only cost \$20,000. She **exaggerated**.
a. Said it cost more than it did
b. Paid \$30,000 for it
c. Didn't like her old car

5

Cholesterol and

Heart Disease

Do you know your **cholesterol** level? Many people don't. a high level of cholesterol in the blood is an important risk factor for heart disease.

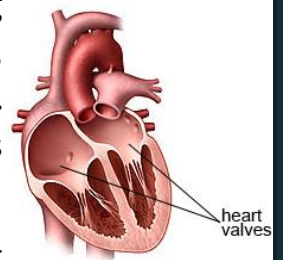
Some people say that the danger of heart disease is **exaggerated**. However, heart disease is a main cause of death in developed countries. Every year more than one million Americans have heart attacks, and half of them die. People with heart disease suffer chest pains that make simple activities, such as walking, shaving or taking a shower, difficult.

said it is more than it is

Research has proven that cholesterol levels are connected with heart disease. One project in Massachusetts has studied the same group of 15 men and women since 1948. The researchers have found that the people who have high levels of cholesterol have more heart attacks.

A natural substance in the blood, cholesterol comes from the liver. The amount of cholesterol is affected by diet and by physical qualities we **inherit** from our parents. One kind of cholesterol sticks fats to the walls of arteries, making them smaller and finally blocking them. It produces a condition called "hardening of the arteries," which causes heart attacks. With tiny cameras, doctors can see blood circulating through the heart **valves**. **Angiograms** are x-rays of the heart arteries. They show fat deposits and blockages caused by high cholesterol.

get



Heart disease begins in children as young as 3 years old. It occurs earlier in boys than in girls. Nearly half of teenagers have some fat deposits on their artery walls. Heart disease develops faster if we have high cholesterol levels and also smoke.

What is a safe level of cholesterol? Adults have a high risk of heart attack if their cholesterol level is above 240 milligrams per deciliter of blood. Below 200 is better. In the Massachusetts study no one with a cholesterol level below 150 has ever had a heart attack. However, about half of American adults have cholesterol levels above 200.

To lower our cholesterol level, we must change our eating habits. Anything that comes from an animal is high in fat and high in cholesterol. The American Heart Association National Cholesterol Education Program says that fat should be no more than 30 percent of our diet. Blood cholesterol levels start to fall after 2 to 3 weeks of following a low-cholesterol, low-fat diet. Dietary changes alone can result in a 10 percent **reduction** of the average person's cholesterol level. **Aerobic** exercise helps, too. Artery blockage can be reduced by as much as 40 percent through changes in diet and amount of exercise.

making smaller
for example,
walking, running,
swimming

We must educate everyone, including children in elementary schools. We must teach them responsibility for their health through classes in nutrition and aerobic exercise. For example, the smart **snack** is fruit. Children must be served fruit in the school cafeteria, along with low-fat meals. Schools must send **recipes** home with the children. Parents must include children in planning and preparing meals and shopping for food.

something small
and fast to eat
instructions for
cooking

Adults, including persons over the age of sixty-five, can lower their cholesterol by 30 or 40 percent. It is never too late to change. One man began his health program when he was seventy-three. By the time he was seventy-seven, he had lowered his arterial blockage from 50 percent to 13 percent and his cholesterol from 320 to 145 without drugs. He went on a vegetarian diet with only 10 percent fat, plus programs to reduce stress and get more exercise.

A low-cholesterol diet that cut out most animal products and high fat vegetarian may be **unfamiliar** to people. The Heart Association says to use no added fat of any kind. Don't fry food in oil. Cook in water, vinegar, or vegetable water. Learn about grains and vegetables. Avoid egg yolks (the yellow part of the egg). Eat potatoes, beans, low-fat vegetables, and fruit. People often **complain** about low-fat diets before they have had time to get used to them. Food can taste good without cream, butter, and salt. You can use olive oil, mustard, fresh **herbs**, or yogurt instead.

strange, unknown

say you don't like something

A new diet can cause general **anxiety**, when people feel worried and nervous about what is going to happen. They must learn to **deal with** the changes in their lives. Sometimes major changes in diet or lifestyle are easier than minor ones because the results are bigger and faster. Fast results **encourage** us.

cope with

How can you control the amount of fat in your diet if you eat in restaurants? Restaurants must provide healthy meals that are low in fat, salt, and cholesterol. A diet is a **personal** thing. Restaurant owners should not make customers feel embarrassed because they want to follow a diet that is good for them. Restaurant owners must learn to give equal **service** to customers on a healthy diet. Some restaurants have items on the menu marked with a heart to show that they are low in fat, cholesterol, salt, or sugar. A few restaurants serve only these recipes.

private, about oneself

Heart disease causes one out of every four deaths in East Harlem in New York City. The East Harlem Heart Program is an educational program. It has 2 goals: to get people to change their diets and to find volunteers to help run educational activities. One way it educates is by street shows. Actors wear costumes and carry big pieces of plastic fat. They entertain so people will listen. Groups of children perform songs and dances that educate people about heart disease and diet. Volunteers lead walking and exercise groups to show people how to begin exercising.

Volunteers also stand in supermarkets to **suggest** healthy give ideas about food choices to shoppers. The volunteers have shoppers taste two kinds of milk to see which tastes better. Most people are surprise that low-fat milk tastes better than the whole milk. Shoppers are encouraged to buy low-fat milk instead of whole milk.

Education costs money, but it also brings results. In 1983, only 35 percent of the Americans public knew their cholesterol levels. By 1990, 65 percent of the people had had theirs checked.

People feel better if the lower their cholesterol through diet. Healthy people are more **confident**. They are more **attractive** to pretty, handsome themselves, as well as to the others. Their friends **stare** at them look intensely because they look so healthy.

We can prevent heart diseases by living a healthful lifestyle and eating the right kind of diet. If people don't do this, two out of three men and women in America will eventually get heat diseases.

a Vocabulary

confidence	anxiety	stare	herbs
aerobic	risk	encouraged	valve
unfamiliar	inherited	personal	snack

1. John's parents _____ him to stay in school even though his grades were not very good.
2. _____ exercise is good for the heart.
3. Is it impolite to ask someone _____ questions?
4. Students often suffer from _____ before the exam.
5. _____ improve the taste of food.
6. Some people are _____ with a low-fat diet.
7. Mark _____ red hair from his mother.
8. It is impolite to _____ at people.
9. If you drive carelessly, you take a _____.

10. I'm hungry now, but it's 2 hours until dinner. I think I'll have a _____.
11. Open the _____ so the water will flow freely through the pipes.
12. If you are sure of yourself, you have _____ in yourself

b Vocabulary

factor	suggestion	deal with	complains
attractive	reduction	service	angiogram
exaggerated	cholesterol	recipe	stress

1. Most television stars are _____.
2. _____ occurs naturally in the blood.
3. A _____ in how much fat you eat might make you healthier.
4. Please give me a copy of the delicious _____.
5. One of the students made a good _____ for what we could do in the International Day program.
6. It is difficult to _____ a child who doesn't behave well.
7. Smoking is a _____ in many diseases of the heart and lungs.
8. Tom said he earned \$1000 a week, but he is really paid only \$800. He _____.
9. The doctor wants my mother to have an _____ to see if her arteries are blocked.
10. Ali always _____ that he has too much homework.
11. This restaurant has good food, but the _____ is slow.
12. The _____ of running away from the dog was too much for the old man, and he had a heart attack.

C Vocabulary Review

Match the words with the definitions.

- | | |
|--------------------|---------------------------------|
| 1. nervous _____ | a. length of time |
| 2. period _____ | b. at the same time |
| 3. habit _____ | c. stage |
| 4. meanwhile _____ | d. act in response to something |

- | | |
|-------------------|-----------------------------|
| 5. fever _____ | e. grind |
| 6. pregnant _____ | f. hit |
| 7. location _____ | g. watch |
| 8. strike _____ | h. die in water |
| 9. react _____ | i. anxious |
| 10. drown _____ | j. usual action |
| 11. solar _____ | k. high body temperature |
| 12. observe _____ | l. of the sun |
| | m. place |
| | n. going to become a mother |

d True/False/Not Enough Information

1. Around 500,000 Americans die each year from heart disease.
2. More than twice as many people had their blood cholesterol levels checked in 1990 as in 1983.
3. Smoking can be a risk factor for heart disease.
4. No direct relationship has been proven between high cholesterol levels and heart attacks.
5. Girls have no risk of heart attack.
6. Low-fat diets always taste bad.
7. Children should learn more responsibility for eating healthful food.
8. People usually feel good about going on a new diet.
9. It can be easier to change our diet a lot than to change it a little.
10. Old people shouldn't bother to change their eating habits because it's too late for it to do them any good.
11. Most people think that whole milk tastes better than low-fat milk.

e Comprehension Questions

1. What are some symptoms of heart diseases?
2. What is "hardening of the arteries"? How is it connected with high cholesterol?
3. Why are angiograms useful?
4. At what age does heart disease start?
5. What level of cholesterol is believed to be safe?

6. How long does it take for cholesterol levels to start to drop?
7. How can schools help teach children healthy eating habits?
8. How can parents help teach children healthy eating habits?
9. What are some ways to reduce fat in your diet?
10. Describe the East Harlem Healthy Heart Program?



Main Idea

What is the main idea of these paragraphs?

1. Paragraph 4 (lines 18-29)
2. Paragraph 6 (lines 35-42)
3. Paragraph 9 (lines 66-75)
4. Paragraph 12 (lines 95-106)



Word Forms

Verb	Noun	Adjective	Adverb
1.	anxiety	anxious	anxiously
2. encourage	encouragement	encouraged	
3. discourage	discouragement	discouraged	
4.	stress	stressful	stressfully
5. personalize	person	personal	personally
6.	stupidity	stupid	stupidly
7. attract	attraction	(un)attractive	(un)attractively
8. inherit	inheritance		
9. familiarize	familiarity	(un)familiar	familiarly
10. suggest	suggestion		
11. complain	complaint		complainingly
12. exaggerate	exaggeration		
13. serve	service		

1. The students waited _____ to hear the results of the test.
- 2a. A shy child needs a lot of _____ to build self-confidence.
- 2b. Marie was _____ by the results of her physical exam after a long illness.

3. Michael felt _____ when he wasn't accepted at the university that was his first choice.
4. Joan felt a lot of _____ when she stood before the class and began her speech.
- 5a. If you tell the salesperson your initials, the store will _____ your new suitcase at no extra charge.
- 5b. _____, I like my initials on my luggage.
6. Marie felt _____ because she did the exercise without reading the directions and did it all _____ wrong.
7. Honey _____ flies and ants. Flies and ants are _____ by honey.
8. Tom _____ a small business and some money from his father when his father died. His friend received a large _____ from his favorite uncle.
9. If you _____ yourself with the language center before the first classes, you will not get confused where you should go.
10. I _____ that we take a CPR class this month. That's a good _____.
11. If you have any _____ about the television set you bought, take it back to the store.
12. To say that you couldn't go to sleep at all last night is an _____. You are _____.
13. A waiter _____ food in a restaurant.

h Irregular Verbs

Learn these verbs. Then put the right verb forms in the blanks, using the first verb in the first sentence, and so on.

Simple	Past	Past Participle
1. Tear	tore	torn
2. Light	lit or lighted	lit or lighted
3. Lie	lay	lain
4. Swell	swelled	swollen
5. Grind	ground	ground
6. Strike	struck	struck

7. Sting	stung	stung
8. Stick	stuck	stuck
9. Deal	dealt	dealt

- Alice _____ her new blouse.
- Dan _____ a fire in the living room fireplace.
- In some countries, it is the custom to _____ down for a rest in the middle of the day.
- Ms. Baxter's hand is _____ because she shut it in the car door.
- Mr. Thomas _____ some fresh coffee beans and made coffee.
- When the clock _____ 12, the people in the street knew it was noon.
- Bob got _____ by a bee.
- The roadrunner _____ out its head in front when it runs.
- Mr. Nevins is a car dealer. He _____ in new and used cars.



Two-Word Verbs: Review

- Sixteen people showed _____ for volleyball practice.
- Never put _____ until tomorrow what you can do today.
- What time does your plane get _____?
- Were you brought _____ in the city or country?
- The teacher left _____ one student on the class list.
- Do you dress _____ for dinner at an expensive restaurant?
- Look _____! There's a hole in the sidewalk.
- I have to read _____ a subject for my speech.
- Kim had _____ a warm jacket so I knew it was cold outside.
- The Bankers have to buy new shoes for their daughter. She grew _____ her old ones.
- We tried to get _____ helping out our cousin, but we had to do it.



Context Clues

These words have more than one meaning. Circle the letter of the best meaning of the **bold** word. Choose the meaning of the words as they are used in these sentences.

1. Mr. Becker has worked in the field of computer science for 10 years.
 - a. An area of specialization
 - b. A place where animals or plants are raised
 - c. The place where baseball is played.
2. Carolyn is often late for class because she has to walk so far from her apartment.
 - a. Until now
 - b. such a long distance
 - c. far enough
3. There are 2.2 pounds in a kilo.
 - a. The unit of English money
 - b. Hits or strikes
 - c. A unit of weight
4. Trappers sometimes cure the skins of the animals they catch before they sell them.
 - a. Dry and prepare for use
 - b. Make better
 - c. A kind of medicine
5. The current value of gold is \$321.
 - a. The movement of electricity
 - b. At this time
 - c. The movement of a stream of water in the ocean.
6. I know that it isn't so.
 - a. Very
 - b. Too
 - c. True
7. Ali and Muhammad live in a large apartment complex near the university.
 - a. related group of buildings
 - b. complicated
 - c. anxiety

k Summarizing

Write a summary of the text for this lesson. Write only the important information using 3 to 5 sentences.

l Guided Writing

Write one of these two short compositions.

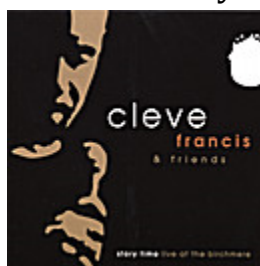
1. You are going to start an educational program about heart disease in your area. How will you do this?
2. Your doctor told you have to lower your cholesterol. Give a detailed plan of how you will follow the doctor's suggestion.

Video Highlights

a

Before You Watch

1. Discuss the question below with your classmates.
 - a. Do you enjoy going to the doctor? Why or why not?
 - b. As you learned in Lesson 4, *cardio-* is a medical word for *heart*. What kind of doctor is a *cardiologist*?
 - c. Have you seen the picture on the right before? What does it mean to you?
2. The video you are going to watch is about a man who has two jobs. Dr. Cleve Francis is a doctor and a country music performer.



Discuss the advantages and disadvantages of both jobs. Then complete the chart. List as many advantages and disadvantages as you can.

	Advantages	Disadvantages
Doctor	1. <i>—good salary</i> 2. 3.	1. <i>—long hours</i> 2. 3.
Country Music Performer	1. 2. 3.	1. 2. 3.

b**As You Watch**

Complete these sentences about Dr. Francis' two careers.

1. Dr. Francis has spent his medical career treating patients with _____.
2. Now he's singing about the pains of a _____.

C**After You Watch**

Watch the video again. Then read the following excerpts. What conclusion can you draw about Cleve Francis from each one? Check your choices.

1. a. *"Things are looking bright for Cleve Francis. The 46-year old heart doctor is undergoing a transformation to country music performer."*
 - He is happy about the change.
 - He is sorry to leave his career as a cardiologist.
 - He believes he is too old to make a career change.
- b. *"Francis journey into country has another trail-blazing aspect. There are few Black performer in the field."*
 - Dr. Francis is not usual.
 - There are not many African-American cardiologists.
 - Most country music performers are not Black.
2. *In the video, Dr. Francis expresses several opinions. Do you agree or disagree? Explain your responses to small group of your classmates.*
 - a. *"There is a link between music and medicine."*

Agree	disagree	no opinion
-------	----------	------------
 - b. *"If you took away the music, books and paintings...life would be bare."*

Agree	disagree	no opinion
-------	----------	------------
 - c. *"The older you are, the better."*

Agree	disagree	no opinion
-------	----------	------------

Activity Page

Who Said What?

Play this game with a group of your classmates. Choose one student in the group to be the Game Host, and another to be the Judge. The rest of the students will be on Team A or Team B. All students except the Host and the Judge must keep their books closed during the game.

Host: Follow these three steps to begin the game.

1. Write these list on the board:.

Robert Louis Stevenson	-----	English writer
Cleve Francis	-----	American cardiologist and singer
Louis Armstrong	-----	American jazz trumpeter
Benjamin Franklin	-----	American philosopher
John F. Kennedy	-----	American president
Madonna	-----	American musician
Robert Hunter	-----	American environmentalist

2. Read this introduction aloud to the two teams.

"I am going to read a quotation aloud. One person on a team will have a chance to guess which person said it. If that person gets it wrong, a person on the other team gets a chance. Are you ready?"

3. Choose a quotation from this list. Ask Team a first, then Team B, and so on.
 - a. "All music is folk music. I haven't ever heard a horse sing a song."
 - b. "Ask not what your country can do for you; ask what you can do for your country."
 - c. "We are living in a material world, and I am a material girl."
 - d. "Early to be and early to rise makes a man healthy, wealthy and wise."
 - e. "Our responsibility is to protect the Earth for a million years."
 - f. "I'm not leading a Civil Rights march into country music."

Judge: Check the team's answer and declare it "right" or "wrong".

(a) Louis Armstrong

(b) John F. Kennedy

(c) Madonna

(d) Benjamin Franklin

(e) Robert Hunter

(f) Clever Francis

Dictionary Page

Learning About Word Stress

You dictionary shows which syllable in a word are stressed. The primary (heaviest) stress mark for *influenza* is shown below.

In-flu-en-za /influɛnzə/ n. (U) a contagious illness spread by viruses. Influenza killed millions in 1918, but now there is a shot that prevents it.

1. Look up these words and underline the syllable with primary stress. Practice saying the words with a partner.

Example: influenza

Antibiotic

malaria

Anxiety

medicine

Caffeine

mosquito

Cancer

nightmare

Diet

resuscitation

Exercise

surgery

bacteria

tuberculosis

headache

vaccination

2. Now group the words in the chart below.

HEALTH PROBLEMS	CAUSES	SOLUTIONS
-malaria	-mosquito	-medicine